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HOW TO BECOME AN EXPERT SHOT.

DEDICATED TO THE NATIONAL GUARD
OF THE
STATE OF NEW YORK.

Compiled by
Chas. Edwin Prescott

TO WHICH HAVE BEEN ADDED THE REGULATIONS
OF THE NATIONAL RIFLE ASSOCIATION,
AND BLANKS FOR RECORDING
MATCHES.

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How to become an Expert Shot.

ALL persons not laboring under any physical disadvantage are capable of gaining some distinction in the art of rifle shooting if they will only adopt a simple course of training, and endeavor to obtain, if only a superficial, knowledge of the influences of wind, light, shade and atmosphere, and the effects they have on the trajectory of the bullet. All marksmen agree that there are certain difficulties to surmount, but none of them are insuperable. By taking pains to acquire a little knowledge, and by steady perseverance, a man may become, if his health and eyesight be good, the best shot in his company, and may occasionally take the highest position in national competitions. But farther than this it is not fair to prophecy. At such gatherings, a steady average shot stands but little chance of winning first prizes, for average shooting is of little use. At the same time an expert shot stands a chance, and only a chance, by scoring that lucky string of bullseyes which shall secure the much coveted prize. Amongst so many excellent shots the element of chance is very great, and has a great deal to do in deciding who shall be the lucky winner of any prize. Thus it is we have that very true and often quoted saying, that a man must not only be a good shot, but he must be a *lucky* shot to gain distinction. It is not suggested that in this little work any new ideas will be given to the well seasoned and good shots who frequent Creedmoor. True, it may form a book of reference from which they may refresh their memories, but this small work is written more for the encouragement of those shots who have yet failed to distinguish themselves, and also for those who are as yet but mere tyros in the art of rifle-shooting. Here, then,

the author has endeavored to give to them information hitherto only possessed by the leading shots of the country.

During his first year, the recruit rarely takes any interest in rifle-shooting, but, stimulated by the example set by other riflemen, he enters upon his second year's training full of hope and ambition to excel as a superior shot in his company, and, if possible, to obtain the marksman's badge. In very few instances does he meet with much encouragement, and at the outset he labors under immense disadvantages. As a rule, the older members, who may have acquired some knowledge of rifle-shooting, look coldly on the young aspirant, who, if successful, they think will lessen their chance at the ensuing meetings. Having gone through the ordeal themselves, they refrain from imparting that knowledge they have gained only by experience, and withhold their friendly assistance. To obtain any success in rifle-shooting, the first thing for a man to acquire is confidence in himself and confidence in his rifle. This is not done by a few weeks' or months' training; indeed, often the first year passes before he attains this important acquisition to good shooting. It is presumed that a perusal of this manual will materially aid the young shot, and that with its assistance more or less success will be obtained in much shorter time than if he had first to discover the paths which he had to traverse. Having perused this work, the recruit will go to the target with confidence, and he will be possessed of such information as shall assure him that if he fails to make a moderate score he has himself to blame. Presumably from the non-publication of any similar work, the information now given by the author has been guarded with jealous care by those who may be termed "the crack shots of the country."

The would-be marksman, when he visits the range for practice, has a very vague notion as to the *modus operandi* for obtaining his object. The common practice is to blaze away at the ranges, taking no note beyond the fact of making a good or bad score. If it is a good score he loses no time in letting his friends know it. If it is a bad one he keeps it to himself. Now this is not practice, at least it is not a practice which will bear any good results in the future. It is well to warn young shots anxious to make large scores, that to fire shots indiscriminately without the aid of a glass, is useless practice. The man who means business, whose time is of consequence, and who would prevent a needless

waste of ammunition, should adopt the following course of practice. First of all, let him find out what his rifle is worth, by firing ten shots at two hundred, and ten shots at five hundred yards, on a moderately still day. If the wind should blow gently from the right, all the better, as his aim would then be dead on or at the lower left corner of the bullseye, according to the force of the wind. The ten shots should not be aimed all over the target, but as near as possible all at one spot. The rifleman should understand, that if fired from a fixed rest, his rifle would not throw the shots in one spot. If the man be steady, he will by the above method at once find out the natural deviation of his rifle. Notwithstanding all that has been said to the contrary, it is certain that in shooting with the present "State Model," there must result more or less deviation. The element of luck has a great deal to do with consecutive bullseyes. With the "Remington" or "Springfield," a moderate shot must be satisfied with centres and a fair sprinkling of bullseyes; at least if he gets no outers he must consider himself a fortunate fellow. The least puff of wind acting on the bullet after it has left the barrel, or the scarcely perceptible movement of the rifle, is sufficient to throw the shot outside the centre line, if not off the target altogether.

Having got over the fact that his rifle has a tendency to deviate, he should carefully obtain a diagram of the result by means of a glass. For real practice, no man should be without a glass at the firing point. If possible, he should have a friend to assist him. He should always endeavor to obtain a definite result with the least possible expenditure of ammunition; such a policy strictly followed up must tend to future success. If an unsteady wind or physical inability should prevent a fair diagram being obtained on the first visit to the range, the experiment should be repeated until the recruit is convinced that he has secured a fair diagram of the capabilities of his rifle. Having once ascertained the mean deviation of his rifle, he may go to work with confidence, for he may know that if he misses a steady shot at long range, it is an error of judgment. Further practice should not be persevered in unless the man is steady. It is quite an erroneous idea to suppose that a man goes to the range to gain steadiness. Before he attempts to fire any number of shots it is well for him to establish the connection between brain, eye and finger. He may learn all this in his own room, first by using the ordinary snap cap, and

then with a percussion cap. For using the latter, procure an old muzzle-loading Springfield, and having lighted a candle, place it on the mantelpiece. Cap your rifle and aim steady. See half the fore-sight just above the notch of the back-sight, at the same time aligning the former on the black portion of the wick, just below the flame. If you aim steady, with the muzzle of the rifle about two yards from the candle, the current of air will blow the light out. The light will only flicker if you do not aim steady. There is a great deal in carefully sighting your rifle and making sure that you take the same amount of sight every shot. In taking sight through a rifle at 500 or 600 yards, to a man with good sight, the top half of his fore-sight would appear to him as a good sized pin's head, and the far-off bullseye about twice that size. Naturally the bullseye would appear larger when not taking sight. The sights of men vary very much. A man who has his eyes deeply set in his head will see plainer at long range than the man whose eyes are more prominent. As a rule the latter use spectacles, often with much success. Practicing the eye-sight by shooting at long range strengthens the nerve of the eye, and the eye-sight improves wonderfully. After some months' practice, the blur which is troublesome at the outset by making the outline of the sight indistinct, entirely disappears. To a man with really bad eye-sight the bullseye in all weathers appears hazy, although the sights may appear plain. If a man would shoot well he must keep himself cool, and attend to the business he has in hand. He must not allow himself to be drawn into any warm discussion on the current topics of the day. In hot weather he should keep as much in the shade as possible, dress in light clothes, and keep his neck free from any tight collar. In wet or cold weather he should take care to keep himself warm and comfortable—not artificial warmth caused by frequent applications to the pocket pistol; such stimulant rarely improves a man's shooting either in hot or cold weather. Indeed, fasting for a few hours prior to a match will steady the nerve and decidedly make the sight clear. In all competitions a loose dress should be worn, and the tailor should be instructed to leave plenty of room for freely working the arms. The great advantage of this easy sort of dress will be felt when the rifleman takes his position at the firing point. At the short ranges a good standing position is the important desideratum, but at the long ranges a man must possess judgment and experience.

Various standing positions are adopted, varying mostly according to the length of the man's arm. At the standing ranges very few men are able to preserve great steadiness, especially when there is any wind at play. The best possible position for a man of ordinary proportions is one which the author has practiced for the past ten years with much success. The feet should be placed a good foot apart, and the firer stand to the right half-face. The knees should be well braced up. Then, with determination to screw yourself well together, grasp your rifle tightly with your left hand almost round the first band. The elbow must be brought completely under the weapon, so that the arm comes into a perpendicular position under the rifle. (Under no circumstances allow it to stand off to the left, or you will become unsteady.) Hold the rifle lightly with the right hand, and with the left hand press it tightly into the shoulder. Don't take too long an aim. If you are unsteady come down, but do not make a practice of doing so. Never aim at the bullseye unless the wind is blowing pretty strong from the right. If you would make a safe, and, if your rifle will help you, a good score, aim to the left of the bullseye, varying your aim from the left edge of the bullseye to the left edge of the target, according to the strength of the wind from the left. At the 300 yards range you must screw yourself up, if possible, still tighter, and if you grasp your rifle firmly you will not make those frequent misses which it is the misfortune of most men to score at this most treacherous of ranges. Whatever you do, aim well away to the left. When a fresh breeze is blowing from the left, you cannot be far wrong if you aim at least two feet away from the left edge of the target. It is want of faith under these circumstances which is the cause of those misses to the right of the target. Follow the above advice, and with even an unfavorable wind you will, in all probability, make a good score. It is want of faith to aim well away from the target at 300 yards that has caused many a man to score a "miss." The author has good reason to be definite in his suggestions as to position, and allowance for wind, pull of trigger, &c., when firing at the shorter ranges; and as he writes with so much assurance on these points, it is only fair to state that his ten years' experience of their value has been productive of the best possible results. By holding the rifle

at the first band the firer has more control over his weapon in a gale of wind—a decided advantage. There is nothing to be said in favor of the knee position. Some have by practice perfected themselves in this unsteady position, but this is only the case where it has suited the formation of their bodies. The position in favor with most riflemen is, no doubt, the lying position. The whole body is in a state of tranquility, and the steadiness of the aim is but slightly affected by the wind. In the lying position some amount of practice is requisite, as most men will unconsciously allow the sights to lean over, the consequence of which would be fatal to good shooting. To those who intend to adopt the lying position (stomach), they will find the following the best for a man of moderate proportions. Curve your legs well away towards your left, and accustom yourself to raise your right shoulder as high as possible. By this means you form an excellent support to receive the recoil of the rifle, and if you raise your shoulder properly you will feel nothing of the recoil; but if you allow the butt of the rifle to rest on your collar bone you will receive such a shock that you will not forget for several days. Grasp your rifle firmly with your left hand, placing the fingers entirely round the rifle, the two middle fingers across the sight-rack, and the fore-finger on the near side of the raised flap. This will enable you to arrange your rifle perpendicularly. Get some friend to watch you occasionally, or you will unconsciously allow the sight to fall over right or left. This would throw the shots left or right low. If “any position” be allowed, no doubt some men will choose the famous “Farquharson” (English Volunteers). This position became very popular at Wimbledon with the competitors in the breech-loading contest, and although to on-lookers the position appeared decidedly awkward, the result of the shooting proved that those who practiced it were quite at home. The “improved Farquharson” is as follows: The firer lies on his back, but leaning over to the right side. The right leg is drawn up almost at an angle, the hollow part of the left foot is allowed to rest on the upper part of the calf of the right leg; the left foot thus forms a V for the reception of the muzzle end of the rifle. The butt of the rifle is placed in the hollow of the right armpit, and, if deep enough, the butt will rest on the ground. The left hand grasps the small of the butt, and the right hand and arm are at liberty to manipulate the rifle. The officials

allowed the sling of the rifle to be thrown under the right leg, so that the rifle could be firmly fixed to the body, and both hands left at liberty for manipulating the gun.

The young shot having gained confidence in his rifle by the course of training herein advocated, he may now venture to acquire some knowledge (if only superficial) of the effect of wind on the bullet and the allowances to be made for it. At the same time he may also note the effects of light and shade, and mirage and refraction, or what in the scientific parlance is termed the science of optics. The influences of the changeable winds, the effect of dry and moist atmosphere and light and shade on the trajectory of the bullet, have often puzzled many a young shot who has looked upon these eccentricities of his rifle as something extraordinary. His want of knowledge how to counteract the evil effect of these influences has caused him to blame his rifle for many a miss, when in reality it has been but the result of his ignorance of the laws which govern the flight of the bullet. There are many ways of judging of the wind's force and direction. On some ranges there is a large red flag blowing on some eminence near the marker's butt. At the firing point there can be no better guide than the smoke of the man's rifle who fires before you. The marksman will often be at a loss what to do in consequence of the flag at the butt and the smoke of the man's rifle drifting in different directions. Cross winds are always puzzling, and the best way to act under such circumstances is to be guided by your sighting shots, and the position of the hits on the target. But in such cases it has been found to be the safest plan to aim dead on the bullseye, unless the wind blows with more than ordinary force from one point. It is necessary to note in your book the direction and force of the wind, and you cannot do better than use the figures of your watch for this purpose. Imagine that the firer stands at 6 o'clock and the targets are placed at 12 o'clock, the wind coming from any point can be registered in your note-book with the greatest accuracy. To register the force of the wind, you can understand A to mean a gentle breeze; B, a moderate breeze; C, a fresh breeze; D, a strong wind; E, a very strong wind; F, half a gale, and G, a gale. It is generally understood, and experience has shown us, that a great deal more allowance has to be made for a left wind than for a right wind; one reason for this is that the grooves inside the barrel take a spiral turn from left to

right, and secondly, there is a tendency more or less for the firer to pull off to the right. Especially is this the case with young shots; so that at 500 yards if the wind is blowing gently from the right, the tendency of the shot to deviate to the right would be counterbalanced by the right wind, and the correct spot for aiming would be just under the bullseye. Whereas, if the wind was blowing with the same force from the left, you would have wind, drift and pull, all going in the same direction, and you would not strike the centre of the target unless you aimed at a spot just outside the left centre line. Some men pull off to the right more than others, and they would make sure of the target by aiming at the left edge of it. A strong side wind blowing straight across the range has the effect of depressing the bullet, and, according to the force of the wind, from one to two degrees more elevation is requisite. These degrees may be taken scientifically by using the vernier scale, which no good shot should be without. A wind from the rear assists the bullet on its flight, hence you must have reduced elevation, always varying it in amount according to the wind's force. In the case of a front wind, you must have more than the average elevation, as a front wind naturally retards the progress of the bullet, and if you did not raise your sight considerably you would have frequent *ricochets*. At all times a front or a rear wind is trying; for, should the wind drop suddenly, your calculations as to elevation will go for *nil*. Now, as has been remarked before, one of the greatest faults of young shots is, that they have not faith to aim under certain circumstances, away from the target. It stands to reason, that if at 300 yards, with a strong left wind blowing, the firer has to aim two feet away from the edge of the target, where must he not aim under similar circumstances if firing at 600 yards? At the latter range, with a strong left wind, aim should be taken quite eleven feet away from the left edge of the target. Many a good prize has been lost through want of faith to aim well away from the target on special occasions, and the young shot should remember that he should but in rare instances aim at any object that he wants to hit. The following tabulated statement of the wind's force, and the allowances to be made, may be safely depended upon. For the left wind, distance must count from the left edge of the bullseye, and when from the right, from the right edge of the bullseye.

ALLOWANCES TO BE MADE FOR A LEFT WIND, COUNTING THE DISTANCE FROM THE LEFT EDGE OF THE BULLSEYE.

YDS.	GENTLE BREEZE.	MOD'TE BREEZE.	FRESH BREEZE.	STRONG WIND.	VERY STRONG WIND.	HALF A GALE.	GALE.
	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.
200	0 6	0 9	1 0	1 3	1 10	2 2	2 6
300	0 9	1 1	1 6	2 0	3 0	3 10	4 9
400	1 0	1 9	2 9	3 9	4 9	5 9	6 9
500	1 6	2 6	4 0	6 0	8 0	10 0	12 0
600	3 0	4 6	8 0	11 0	16 0	19 0	20 0
700	3 8	7 0	11 0	16 0	20 0	24 6	29 0
800	5 0	9 0	14 0	20 0	26 0	31 0	37 0
900	6 0	12 0	19 0	26 0	34 0	41 0	50 0
1000	8 0	15 0	24 0	35 0	42 0	54 0	68 0

ALLOWANCES TO BE MADE FOR A RIGHT WIND, COUNTING THE DISTANCE FROM THE RIGHT EDGE OF THE BULLSEYE.

YDS.	GENTLE BREEZE.	MOD'TE BREEZE.	FRESH BREEZE.	STRONG WIND.	VERY STRONG WIND.	HALF A GALE.	GALE.
	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.
200	Aim, middle of bullseye.	0 2	0 4	0 6	1 0	1 6	2 0
300		0 3	0 6	0 9	1 6	2 6	4 0
400		0 4	0 8	1 0	2 0	4 0	6 0
500		0 6	1 0	2 0	4 0	6 0	8 0
600		1 0	2 0	4 0	8 0	10 0	12 0
700		2 0	4 0	8 0	11 0	14 0	17 0
800		4 0	8 0	12 0	16 0	20 0	24 0
900		6 0	12 0	18 0	23 0	28 0	33 0
1000		9 0	15 0	24 0	30 0	36 0	42 0

The author has found this table of great practical utility. In adopting it, the firer must be careful to take into his consideration and make the necessary deductions for counteracting influences. The mere fact of a man being uncertain as to what allowances he should make for wind, is sufficient to produce nervousness, and in many instances make him careless in his aiming; whereas, if he is satisfied in his own mind that the direction of his shot is in line with the centre of the target, it remains for him only to increase or decrease his elevation as the circumstances of the case may require. Shooting is but the science of angle, and on the accuracy of that angle according to the surrounding circumstances does the excellency of the shooting depend. Shooting with a traversing foresight may be more scientific in principle, but at any rate the result attained cannot be so meritorious as if shooting with a rifle with a fixed foresight.

Having made himself master of the wind by means of a careful system of note-taking, it is then well to acquire some superficial knowledge of the effect of light and shade, refraction and mirage on the flight of the bullet. A want of knowledge in this respect is often the cause of a bullet flying clean over the target, or that most annoying of all things, a *ricochet*. It is scarcely necessary to say that such a catastrophe will spoil your chance of winning any valuable prize, and may occur to any man who may be ignorant of the science of optics, or suffer a relaxation of that constant observation which should be persevered in throughout all contests. The author will endeavor to prove that in nineteen instances out of twenty this is the firer's own fault, and that a miss of this description is either caused through ignorance or inattention to the changes of wind and light during a contest. Now, a dry atmosphere causes the barrel to become incrustated; this, by the increasing heat of the barrel, becomes hardened, and prevents the easy passage of the bullet. The consequence is, that unless greater elevation is used, the bullet will fall short of the target, and we have what is only too well known, a *ricochet*. All riflemen should bear in mind, that in dry weather, allowances should be made for increased elevation, the amount of which would necessarily be guided by the opposite influences prevalent at the time. It must also be borne in mind that a man commences shooting with a clean barrel, and the incrustation becoming more hardened as the number of shots increase, you must have slightly increased ele-

vation every shot. Say, that with your clean barrel you make a bullseye, and the second and third shots are fired out of an incrust-ed barrel ; these shots will, in all probability, drop lower and lower, until you have a *ricochet*. With a moist atmosphere we have an opposite effect. On a damp drizzly day, a shot fired with average elevation would go high on the target, hence the elevation should be reduced by the vernier before any shot is fired. To obtain regular shooting, most assuredly it is better to fire in damp weather than in dry and hot weather. Presuming that a man made a bullseye for sighting out of a clean barrel, with scarcely any alteration of the vernier, he will keep that same elevation throughout the competition if the atmosphere remain the same. If anything, his shots would go a little higher as the moisture of the barrel increases. If it were not that we had other influences at work counteracting the effects of a moist and dry atmosphere, a fair amount of allowance would have to be made for the latter. Therefore, it should be remembered, that in dry weather, while it is found necessary to increase your elevation, you have at the same time to consider the counteracting influences caused by mirage and refraction on your aim. In very dry weather the atmosphere is usually bright and clear, and while you have to allow more elevation for a dry atmosphere, you have to allow less for the brightness of the atmosphere ; the brightness having the effect of bringing the target nearer the eye. On a bright, clear day, the target stands out in bold relief, and if you used your average elevation you would fire high and not at the real target, which, as a matter of course, had not moved from its position, but had been apparently raised by the refraction of the atmosphere, the cause of which I shall presently explain. On a damp and muggy day, while you have been instructed to allow more elevation for the moisture of the barrel, you must allow something less for the darkness of the atmosphere, which causes the target to appear more distant and obscure. In this case you do not actually fire at the real target, but its image, which is sunk lower through the extraordinary influences of the atmosphere. No end of examples can be given and experiments made in ocular demonstration of this wonderful phenomenon, which young shots especially, cannot be made to believe. The experiments are of such a nature that any man can try them himself, and he will thus see the absurdity of trusting to the information he may obtain from his

sighting shots, supposing that they are allowed, and that he has the good fortune to have a friend handy to see where they go, should they not strike the target. Let him fix any old tube (an old barrel if he can procure one), and align it on some object distant 500 or 600 yards. The object can be a target, or anything else, so that it can be distinctly made out. It is best to align it so that he can see the object on a dark day. Then let him look through the tube on a bright day, and the target will have entirely disappeared, viz: it will have apparently raised itself above the alignment of the barrel. On the bright day raise your barrel and align it on the target, and if you look through it on a dark day it will have again disappeared, viz., it will have apparently dropped down to its original position. A moment's consideration will convince the rifleman that on a clear, bright day, he must have less than the average elevation, and that on a dark day, more than the average elevation; and that at all times when you have to allow for the dryness or the moisture of the atmosphere, you must make a reduction in the allowance made according to the brightness or darkness of the atmosphere. It is a fact that more or less allowance has to be made for the moisture or the dryness of the barrel. It has often been noticed that there is on the whole more regular shooting on a dull, gray, and damp day, than on a day when the barrel gets heated and the sun is frequently obscured by clouds. The reason is obvious. In the former case the weather is more settled, and, once on the target, the rifleman has not to be troubled with any of these tiresome influences, which, it has been shown, would affect the quality of the shooting in the case of non-scientific shots. But, as most contests are not shot when the sky is overcast, it is well for a man to know what to do on bright and sunny days when the clouds are drifting through the sky, causing all manner of lights and shades for every shot fired. There is no doubt that when this state of things exists it is difficult to obtain fine shooting, and it is out of the question to expect good results from a man who is deficient in his knowledge of the law of refraction and mirage, and the effects of light and shade. The fixed barrel, previously referred to, can be again used to demonstrate what has been said in respect to light and shade. Let the rifleman look through the barrel aligned on a target on a cloudy day. If he looks through the tube when the sun is shining, and a cloud causes a shadow to pass over the target, the moment the

shadow passes on to the target he will see the target distinctly drop, and it will to all appearance rise again when the sun re-appears. The best of squads firing at 500 and 600 yards take no heed of these frequent changes of light, and the consequences are fatal. It is hard to persuade a man scoring consecutive bullseyes to alter his aim by two feet when any change of light takes place. Hence it has been observed over and over again, that when the light has suddenly changed, a round of bad shots has been the result, and the probability that such a disaster has been caused by some extraordinary phenomena in the atmosphere has been the only hypothesis suggested by one or more of the competitors. When the matter is thought over, it really does require a large amount of faith for a competitor who has succeeded in scoring four bullseyes out of five shots to alter his aim by two feet, when the optical laws have rendered such a course imperative if he wishes to make a fifth. This want of faith, if he has possessed the knowledge, has lost many a man a valuable prize.

The barometer and the hygrometer are constantly referred to by scientific shots, but others very rarely consult them, for the simple reason that they do not understand their use. Therefore, for their information, it is well to state that the hygrometer indicates the amount of moisture in the atmosphere, and the barometer, the exact pressure of the air on the square foot. There is also the anemometer for noting the wind's force. All these instruments may be very valuable to small-bore shots, but for men shooting with any rifle with a fixed foresight, the use of such instruments is almost unnecessary. While engaged in a contest there are from twenty to thirty things for a man to keep in mind, and for average shooting, a superficial knowledge of these matters is all that is necessary. Possessed of this knowledge, assisted by a steady hand and tolerably good eyesight, a man may raise himself to the highest pinnacle of fame. However, there may be some who would consult the barometer and hygrometer, and for their information, they should understand that the greater the amount of moisture indicated by the barometer, the lower will be the elevation required, and *vice versa*. When shooting with the sun shining full upon the sights, the rifleman should understand that when the sun is on the right hand, it has the effect of lighting up the right side of the foresight, and the left side of the notch of the backsight. Under these circumstances

the aim will be false and you shoot to the left. The allowance to be made for this is not great, but it is best in such cases to shoot up to the sun, or rather aim away from the right edge of the bullseye.

Of all the drawbacks to good rifle-shooting, there is none so great as the influence of refraction or mirage. It is essentially necessary that riflemen should know something of the influences which mirage and refraction have on the aim of the firer. All riflemen should be careful to note the appearance of the atmosphere each time they visit a range. The varied effects of the atmosphere can be easily observed by looking through a fixed barrel at the target at different periods of the day and in all sorts of weathers. If this is done, the target will certainly be seen under different conditions at mid-day, to what it is in the morning or evening, the target having to all appearances shifted. It is certain that there are as many changes in the state of the atmosphere as there are in the winds, and while the author has endeavored to show what had best be done in many instances, he would strongly advise the reader to adopt a most careful system of note-taking, and to do his best to reconcile the varied changes of light and wind by noting their various phases. By refraction is meant the effect which transparent mediums produce on light in its passage through them. Professor Pepper has done much in late years to enlighten us on this all important branch of a rifleman's training. It is the action of the atmosphere on light which gives us the aurora borealis and the varied and glorious sunsets, both of which at times represent scenes of grandeur which are truly magnificent. Were it not for the atmosphere we should see the sun as a dense white light set in a black sky, and there would be none of those beautiful skies of azure blue, which form the canopy of heaven. Refraction of light may be explained as follows: a ray of light which would otherwise dart in a straight line is intercepted at periods by the atmosphere. This is called refraction. The word comes from a Latin word, which signifies to break back; thus it is that a ray of light which enables us to see a target through a tube at one part of the day, is by a change in the atmosphere turned out of its course, and as we have not the power of seeing round the corner, the target is hidden from our view. This fact can be exemplified in many simple and various ways. A stick inserted

in a pail of water will have all the appearance of being bent, but the best example is to place a coin in an empty basin and stand a sufficient distance away from it, so that the rim of the basin hides the coin from view. Without changing your position, let some person pour water into the basin, and the coin—rather the image of the coin—will rise up to view. Now it stands to reason, that if you aimed at that image of the coin you would not be likely to hit the real one. The refraction of light has precisely the same effect on the target. The ray of light passing through one medium into another of different density, is turned out of its course at a slight angle. Mirage is but another kind of refraction. There is both lateral and vertical mirage. If the variation of the refractive power of the air takes place in a horizontal line, perpendicular to the line of vision, viz., from the right to left, then we have a lateral mirage. Such an effect would make the target appear high, right or left, and on both sides, if the variation of the refractive power is the same on each side of the line of vision. It sometimes occurs that there is both a vertical and lateral variation of the refractive power in the air. This would probably make the targets appear elongated. The size would consequently be increased, and the target appear almost half the distance it would appear under other circumstances. On the contrary, the refraction might have the effect of contracting the object, and the target would appear far off. On a cloudy day, if a gleam of sunshine comes over your sight, but not over the target, aim two feet higher than usual. But you must aim two feet lower if the sun should light up the target instead of your sights. If the atmosphere is bright and clear, and the target is thrown into the shade, you require to aim about two feet higher. If shooting towards the south in the shade, and the sun should suddenly light up your sights, aim two feet higher; but if it lights up the target and not your sights, aim two feet lower. If the sun is out in front when you have been shooting southwards, and he is suddenly hidden by a cloud, aim two feet lower. If you are shooting to the north with the targets lighted up, and he is suddenly hidden, aim two feet higher. The following effects of the refraction of the atmosphere should never be forgotten: the target will appear low on a damp gloomy day, and it will also appear low when the sun is setting behind the target; the target appears high

on a clear bright day, and it will remain so should a shade come over the firer; but immediately the shade passes over the target, the latter appears low. By using the vernier, having found the correct sighting at one range, it is easy to calculate the same amount of allowance from your average elevation at the next range, but you must make increased allowances for the force of the wind. One degree on the vernier will make a difference of nine inches on the target at 600 yards. The firer should always be on the alert for any change in the wind or light. When on any strange range, look out for cross currents which would interfere with prevailing winds. There are sure to be cross currents where there are deep valleys, ravines, and gullies. This makes good shooting exceedingly difficult, and especially so when the wind is gusty. When the wind is blowing very strong, men of experience never fire when the wind drops for an instant. Try, if possible, to get off each shot when the wind is blowing with about the same force, and you will be more likely to have regular shooting. It is not likely that a lull in the wind would last sufficiently long to allow the bullet to reach the target, but the wind would catch it while on its journey and turn it out of its course. When the wind is gusty always shoot up to the wind, that is to say, make less rather than full allowance, so that any additional strength in the wind's force would blow the bullet into the bullseye rather than out of it. This is what is called making sure of the target. While shooting, don't walk about and tire yourself, but try and sit in the shade, and refrain from joining in the busy crowd at the firing point. It is decidedly a bad plan to watch the scores—it is best to make the best score you can yourself, and wait until the prize list is out to see if you are a winner. The best time for a man to shoot is either early in the morning or late in the evening. Unless the sky is overcast, shooting in the middle of the day is very difficult, as the sun shines full in your face, and a most peculiar light surrounds the targets, approaching almost to haziness, caused by the excessive heat.

Very young shots may not be aware that a shot fired from a rifle does not go in a direct line to the target. The line which the bullet takes in its journey from the rifle to the target is called the trajectory, and the height of the curve is varied according to the distance at which the rifle is fired. Some

rifles have a higher trajectory than others. A rifle with a flat trajectory is the one preferred, as its course to the target is more direct, and you are not so likely to go under or over the target.

It is a great mistake to have your pull of trigger too light; six-and-a-half pounds is about the correct thing. If you go too near the regulation, 6 lbs., you are liable to disqualification, should the nature of the weather bring it one drachm below the 6 lbs. pull. On the other hand the extra $\frac{1}{2}$ lb. pull will make no difference to you if you accustom yourself to its use. Great care should be taken as to the mode of pressing the trigger. From the first moment that you commence taking aim a gradual and increasing pressure should be put upon the trigger, which can be increased until you are quite certain as to your aim, and then the slightest extra squeeze will be sufficient to let fall the hammer. Curl your finger well round the trigger and press it as near the top as you can. If you go too near the end you will find the pull off is not so pliable, although of greater strength. The extra squeeze should be like squeezing the last drop from an orange.

No rifle shot should be without a vernier screw sight adjuster. By its use the sliding bar can be adjusted to one-hundredth part of an inch, or even half that distance is distinguishable.

Having ascertained the sighting for each hundred yards, the fifties can be got accurately. Say you shoot with 28 degrees at 500 yards, and 55 at six hundred yards, you would split the difference and take $41\frac{1}{2}$ at 550. Again, if you find that increased elevation is required at 500 yards, you can, with the greatest nicety make a proportionate increase at 600 yards. Care must be taken when applying the regulations to distances above 600 yards up to 1,000 yards, that a proportionate increase is made at each range, viz:—if the difference between 500 and 600 yards sighting is 27 degrees, you must allow 30 between 600 yards and 700 yards, $33\frac{1}{2}$ between 700 yards and 800 yards, but much will depend upon the state of the weather.

The first object of all who would become expert in the use of their rifles is to gain confidence in their own particular weapon. To do that, a man must endeavor to find out by *any* means the precise radial deviation which with a steady hand and wind his rifle will throw a number of shots. To attain the above result, nothing will help a man so much as a traversing wind-gauge. I believe that defective sighting has more to do with indifferent

shooting than any other cause. A man who aims a certain distance off the bullseye, having no definite object to aim at, makes a bullseye, but he is not so likely to follow it up with another as the man who aims at a particular spot. The grand object of the rifleman should be to take the same amount of sighting for each successive shot, and he will certainly get better average results than if he took his sight, as 99 out of every 100 do, by the rule of thumb. The firer should remember that if he takes the left edge of the target on a line with the bullseye at 500 yards, he never knows whether he is aiming at the top or the base of the bullseye. Now the bullseye is two feet deep, and this difference in the aim is, I need hardly say, quite sufficient to throw the shot over or under the target. If the sighting is so deceptive when aiming on the left edge of the target, what must be the result when the force of the wind renders it necessary to aim from 12 to 20 feet off the target? Why, unless some particular point is taken, you cannot expect to get regular shooting. In squally weather, the rifleman would gain some confidence if he assured himself that however bad the elements, or however obscure the target, *the target is there*, and is of the same size, quite large enough for him to hit at 500 yards, and it is for him to find the correct road to that target.

In concluding, the author has to make some apology for not classifying his subjects. He has not done so for several reasons. He has always found that subjects classified are not borne upon the memory so easily as those produced in a readable form and associated with ideas which are familiar with the reader. Hence he has brought to his assistance the science of phrenotypics, the art of associating unfamiliar with familiar ideas, thereby impressing the substance of new ideas on a mind of average capabilities.



REGULATIONS

ADOPTED BY THE NATIONAL RIFLE ASSOCIATION TO GOVERN ALL COMPETITIONS IN MARKSMANSHIP.

1. GENERAL REGULATIONS.

I. The meetings will be conducted under the direction of the Executive Committee of the National Rifle Association.

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

III. All members of the National Guard competing for prizes restricted to that organization, shall appear in the authorized full-dress or undress uniform of their regiment.

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

V. No hair triggers will be allowed.

VI. No fixed artificial rests will be allowed, the forearm and hand being clear of all support.

VII. Competitors may wipe out or clean out their rifles during any competition, and may shoot with the same rifle, provided they do not delay the squad by so doing. Any competitor delaying his squad will be passed by.

VIII. No one will be allowed to join a squad after the commencement of the second competitive round.

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

2. DISQUALIFICATIONS AND FINES.

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

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

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

XIV. Any member of a squad or firing party who shall absent himself without leave during the firing, or fire a shot from any other firing point before the squad has completed its shooting (except in pursuance of orders), shall be disqualified in that competition.

XV. Any competitor refusing to obey any instructions of the Executive Committee or their deputies, or infringing any of the preceding regulations, or being guilty of unruly or disorderly conduct, or being intoxicated, will be immediately ruled out of all further competition, and forfeit any entrance fees he may have paid.

XVI. Any person, whether a competitor or not, interfering with any of the firing squads, or annoying them in any way, will at once be expelled from the ground.

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

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

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

XX. Any competitor or other person found with a loaded rifle, except at the firing points and within the hours of shooting, may be debarred from further competition during the meeting.

XXI. In National Guard competitions any competitor using any ammunition other than such as is issued from the N. R. A. magazine, or in any way tampering with the ammunition so issued, shall be disqualified from competing for any prizes during the meeting.

3. RETURN OF ENTRANCE FEES.

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

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

XXIII. Entries for the State Prize shall under no circumstances be returned

4. PRIZE WINNERS.

XXIV. All winners of prizes shall apply to the headquarters tent for a certificate, which they must give up on receiving their prizes.

XXV. All money prizes shall be paid on the ground, and winners of prizes, who have the option of taking them in money or in kind, shall announce their decision to the Secretary before the close of the meeting.

XXVI. The regulations for any public presentation of prizes will be announced during the meeting.

XXVII. All prizes not claimed by the 30th November shall be forfeited to the Association.

5. DISTANCES AND TARGETS.

DISTANCES.

There shall be ten distances, viz.—100 yards, 200 yards, 300 yards, 400 yards, 500 yards, 600 yards, 700 yards, 800 yards, 900 yards, 1,000 yards.

TARGETS.

The size of the target shall be—

Up to 300 yards, 6 ft. x 4 ft. ; bull's eye, 8 inches square ; centre, 2 feet.
 Over 300 to 600 yards, 6 feet square ; bull's eye 2 feet square ; centre, 4 feet.
 Over 600 to 1,000 yards, 6 ft. x 12 ft. ; bull's eye, 3 ft. square ; centre, 6 feet.
 In all cases bulleyes shall count 4 ; centres, 3 ; outers, 2.

6. MARKING.

Any objection to the scoring of a hit must be made *before another shot is fired*, otherwise the shot must stand as signalled.

7. RIFLES.

The Rifles shall be classified as follows :

CLASS I.

Military rifles of *bona fide* regulation pattern, as issued.

1. Minimum pull of trigger, 6 pounds.
2. Sights strictly in accordance with regulation pattern.
N. B.—They may be blackened; but white, red, or other coloring matter will not be allowed.
3. Any pad or shoe for the heel-plate of the butt admitting of removal, and thereby allowing of variation at pleasure in the length of the stock, will be disallowed.

CLASS II.

“Any rifle,” maximum weight, 10 pounds.

1. Sights of any description, except telescope, magnifying, and such *front* aperture sights as solid discs or bushes pierced in the centre, which cover the target so as to conceal the danger signal when displayed.
2. Minimum pull of trigger, 3 pounds.

8. AMMUNITION.

1. In all competitions restricted to members of the National Guard, none but the regulation ammunition, similar to that issued from the N. R. A. magazine, shall be used. The ammunition so issued shall in no way be tampered with.
2. In other competitions, unless otherwise specified, any ammunition may be used.
3. Ammunition for the State Prize will be issued upon the ground. In other matches competitors must provide their own ammunition.
4. Cartridges (50 cal. metallic) can be purchased on the ground at 75 cents per 20 rounds.

9. POSITION.

1. Up to 300 yards the shooting shall be standing. At distances above 300 yards it shall be in any position. By “any position” is meant any position that any person would be able to take on level ground.

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

2. Sighting shots may be fired in any position.

10. ORDER OF SHOOTING.

1. In all competitions restricted to the use of breech-loading rifles, the competitors shall place themselves at the firing points by twos, who shall fire alternately until they have fired all their sighting and competitive shots.

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

11. SHOOTING.

1. Two sighting shots shall be allowed to every competitor at each distance on payment of ten cents a shot.

2. Tickets for the sighting shots will be sold at the headquarters tent. They will hold good for any match during the meeting, and will be delivered up to the register-keeper when a shot is taken.

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

4. Competitors who, at gun-fire, have not completed the number of rounds prescribed by the conditions of a competition, shall be allowed one sighting shot when such competition is resumed, without charge.

12. TIES.

The names of competitors who have to shoot off ties will be posted up daily on the bulletin-board at 10 A. M. and 3 P. M.

Ties shall be decided as follows :

IN INDIVIDUAL SHOOTING.

1. When the firing takes place at more than one distance, by the score made at the longest distance, and if still a tie, and there be three distances in the competition, by the score at the second distance.

2. By the fewest *misses*.

3. By the fewest *outers*.

4. If still a tie, by inverse order of shots counting singly from the last to the first.

5. By firing single shots at the longest range.

IN TEAM SHOOTING.

1. By the aggregate scores made at the longest distance in the competition.

2. By the fewest *misses*.

3. By the fewest *outers*.

4. By the competitors who have made the highest score on each side firing five rounds at the longest distance in the competition.

N. B.—When ties are shot off, one sighting shot shall be allowed without charge.

13. ENTRIES.

FOR THE STATE PRIZES.

1. For the State prizes every company and independent subdivision of the National Guard shall be entitled to send one of its members as competitors; and in every regiment or battalion the commanding officer may, in addition, nominate sufficient members from the regiment at large to make a "team" of twelve.

Field and other officers are eligible for the regimental nominations.

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

3. In all cases competitors for the State or other prizes offered to representatives from military organizations must be *regularly enlisted members in good standing* of the regiment which they represent.

MODE OF ENTRY.

1. All entries must be made to the Secretary at the office of the Association, 93 Nassau street, before noon on the day preceding any regular match.

2. On receipt of the entrance fee for any match (except in case of the first match), a ticket will be given, which must be presented at headquarters on the range, and exchanged for a register ticket containing the time and target at which the competitor is to shoot.

For the first match the register ticket will be given out as the entries are made.

3. The matches will take place, if possible in their order. The time for firing them, together with any deviation from the rules, will be posted upon the bulletin as long beforehand as practicable, and if possible announced through the press.

4. Temporary discontinuance on account of bad weather will be at the discretion of the Executive Committee, which will not, however, be exercised except in case of a *severe storm*.

5. Competitors are required to secure their register ticket *in advance of the firing* for the different matches for which they have entered, and to follow the orders as posted.

6. A register ticket may be transferred at any time before the firing for the match has passed, by exchanging it at headquarters for one having the name of the new holder.

7. Any erasure or the substitution of one name for another will render the ticket invalid.

14. POST ENTRIES.

1. Entries made on the ground will be charged 50 per cent. additional. Members of the Association, entering for any match on the range, must exhibit their members' ticket.

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

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

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

15. INSTRUCTIONS TO COMPETITORS.

1. All the Competitors in camp will be subject to police regulations.

2. All competitors camping must bring their own blankets, etc.

3. Any competitor protesting against the ruling of the officer of the squad, or feeling himself aggrieved in any way, must make a statement of his grievance in writing, giving the names of two or more members of his squad who can bear him out in his statements, and hand it in to the Range Officer, who will lay the matter before the Executive Committee, who will decide the matter on the ground. The decision shall be given in writing to the Secretary, and shall be final, subject to the power of the Executive Committee or any two of them, at their discretion, to refer any question to the decision of the Board of Directors, whose decision on such question shall be final. No exception will be allowed, however, to the marker's signal, or the decision of the umpire.

4. Unless otherwise ordered, the shooting shall begin daily at 10 A. M. An intermission in the firing of one hour will be had at as near noon as the progress of the matches will permit, signalled by firing a gun—the firing to commence fifteen minutes after the firing of a second gun.

5. Pools will be opened daily at targets unoccupied by prize competitions.

6. No practice will be allowed upon the range during the week of the meeting.

By order of the Association,

WM. C. CHURCH,

President.

HENRY A. GILDERSLEEVE,

Secretary.

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All of their own make, from ORIGINAL DESIGNS,

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Stem Winders, in great variety, and new Styles of Cases.

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Chronographs, with Split and Independent Seconds.

Repeaters, striking Hours and Quarters.

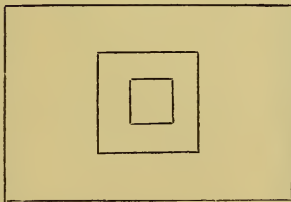
Repeaters, striking Hours and Minutes.

Self-Acting Repeaters, striking Hours and Quarters.

Calendar Watches, showing Day of the Week and Month,
and Changes of the Moon.

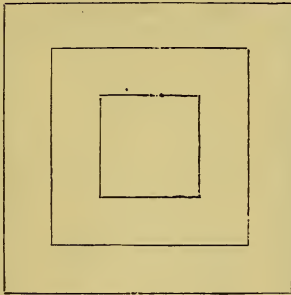
Particular Attention given to Cleaning and Repairing
Fine Watches.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



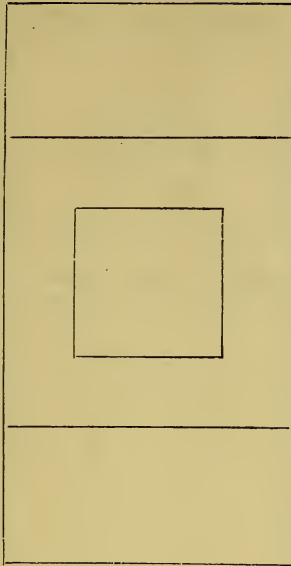
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



FIRST CLASS TARGET.

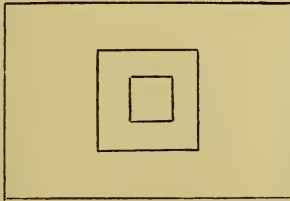
Date,	Wind—Direction of,	Time,	Force of,																	
				1	2	3	4	5	6	7	8	9	10	Total.						
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Remarks.

6 feet by 4 feet.

Centre, 2 feet square.

Bullseye, 8 inches square.

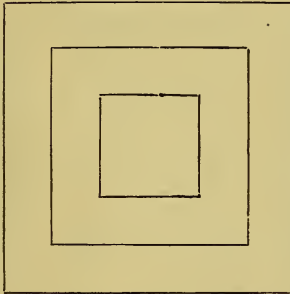


THIRD CLASS TARGET.

6 feet square.

Centre, 4 feet square.

Bullseye, 2 feet square.

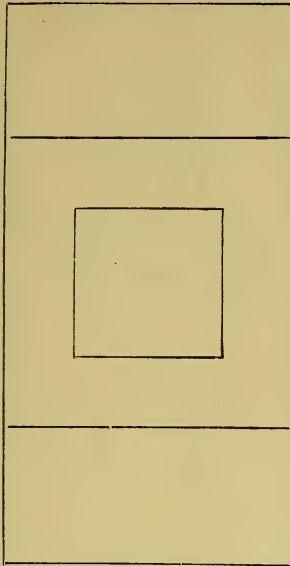


SECOND CLASS TARGET.

6 feet by 12 feet.

Centre, 6 feet square.

Bullseye, 3 feet square.



FIRST CLASS TARGET.

Date,

Wind—Direction of,

Weather,

Rifle,

Elevation,

Time,

Force of,

Cartridge,

Remarks.

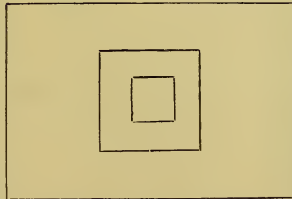
1 2 3 4 5 6 7 8 9 10 Total.

Yds.

Yds.

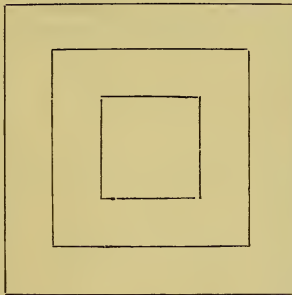
Yds.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



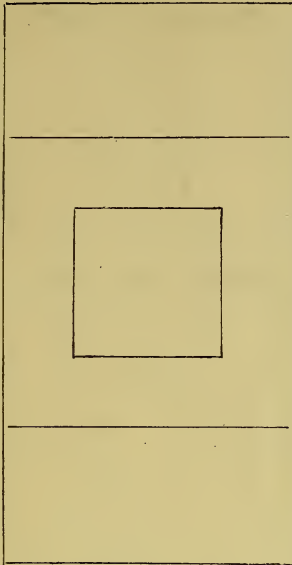
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Centre, 4 feet square.
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SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



FIRST CLASS TARGET.

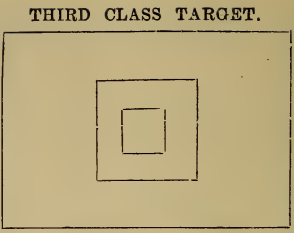
	1	2	3	4	5	6	7	8	9	10	Total.
Yds.											
Yds.											
Yds.											

Date, *Time,* *Force of,*
Wind—Direction of,

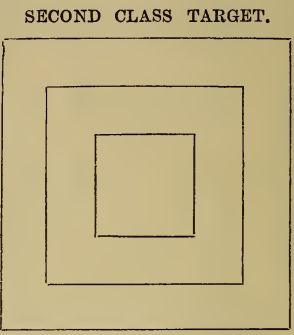
Weather, *Cartridge,*
Rifle,
Elevation,

Remarks.

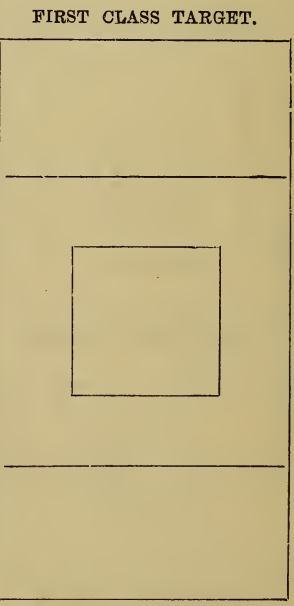
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Centre, 2 feet square.
Bullseye, 8 inches square.



6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



Date,

Time,

Wind—Direction of,

Force of,

Weather,

Rifle,

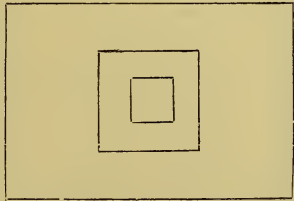
Cartridge,

Elevation,

	1	2	3	4	5	6	7	8	9	10	Total.
Yds.											
Yds.											
Yds.											

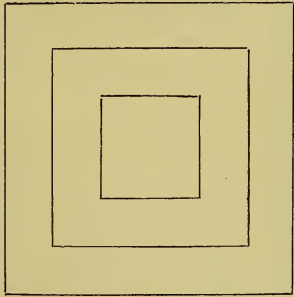
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



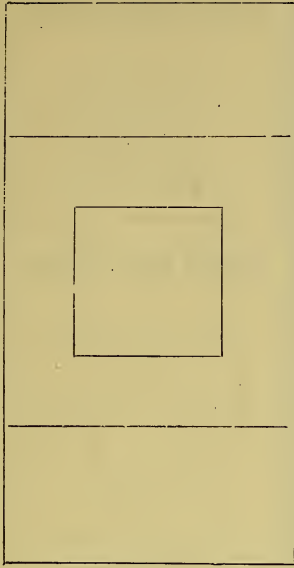
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



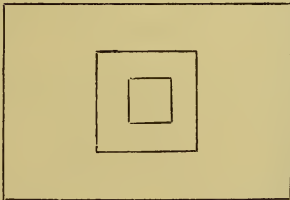
FIRST CLASS TARGET.

Date,	Time,	Wind—Direction of,	Force of,	1	2	3	4	5	6	7	8	9	10	Total.
				Yds.										
				Yds.										
				Yds.										

Cartridge,

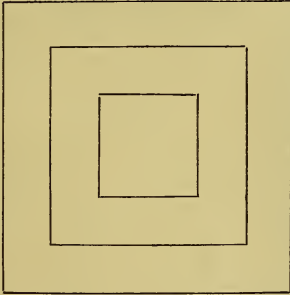
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



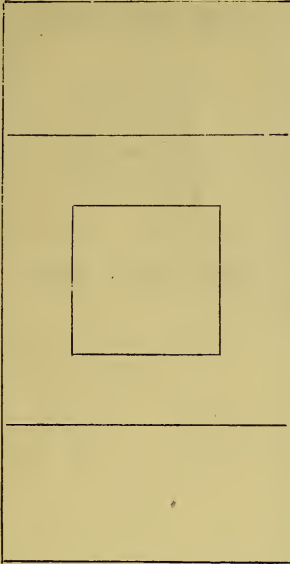
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

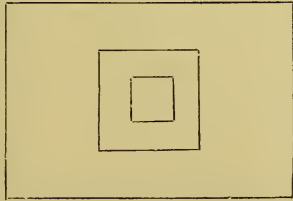


FIRST CLASS TARGET.

Date,	Kind—Direction of,	Weather,	Rifle,	Elevation.	Time,	Force of,	Total.													
							1	2	3	4	5	6	7	8	9	10				
							Yds.													
							Yds.													
							Yds.													

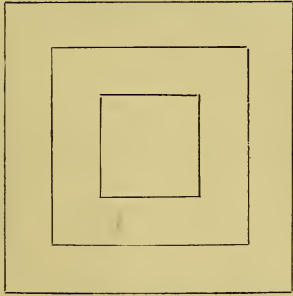
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



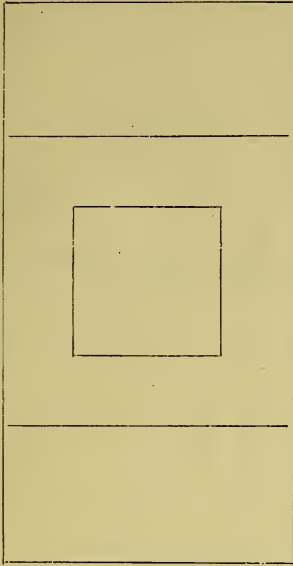
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

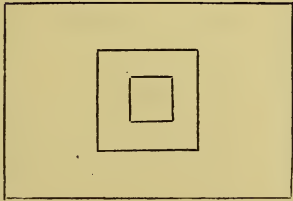


FIRST CLASS TARGET.

Date,	Time,	Force of,	1	2	3	4	5	6	7	8	9	10	Total.
Wind—Direction of,													
Weather,													
Rifle,		Cartridge,											
Elevation,													

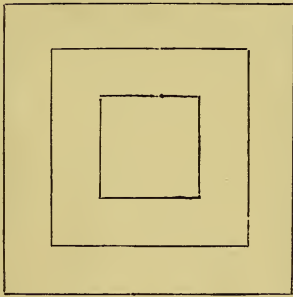
Remarks.

5 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



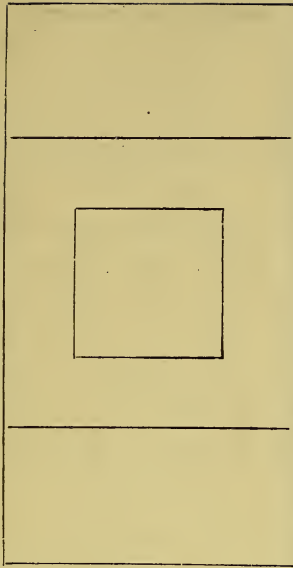
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

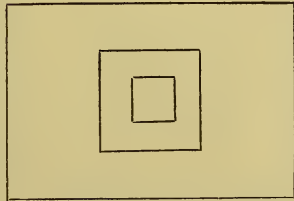


FIRST CLASS TARGET.

Date,	Wind—Direction of,	Time,	Force of,																	
				1	2	3	4	5	6	7	8	9	10	Total.						
				Yds.																
				Yds.																
				Yds.																

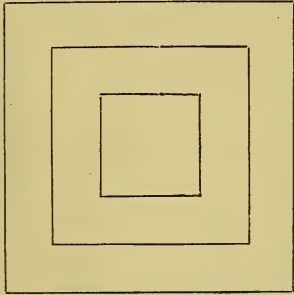
Remarks.

5 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



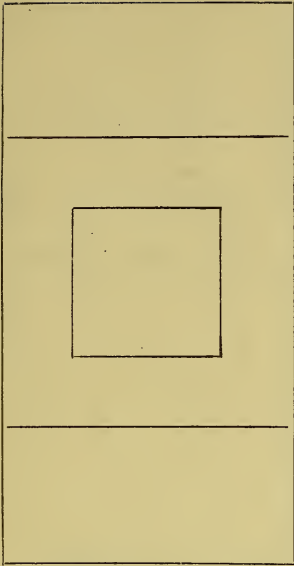
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



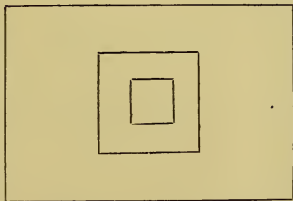
FIRST CLASS TARGET.

	1	2	3	4	5	6	7	8	9	10	Total.
Yds.											
Yds.											
Yds.											

Date, *Time*, *Force of*,
Wind—Direction of,
Weather, *Cartridge*,
Rifle,
Elevation,

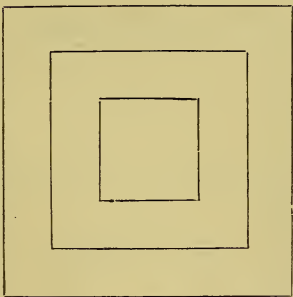
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



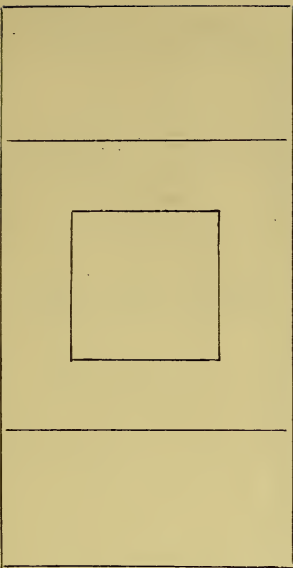
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



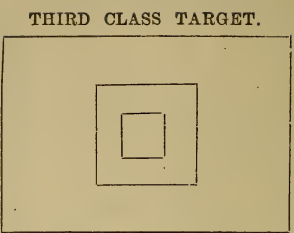
FIRST CLASS TARGET.

	1	2	3	4	5	6	7	8	9	10	Total.
Yds.											
Yds.											
Yds.											

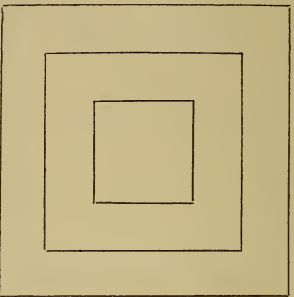
Date, *Time*, *Force of*,
Wind—Direction of,
Weather, *Cartridge*,
Rifle,
Elevation,

Remarks.

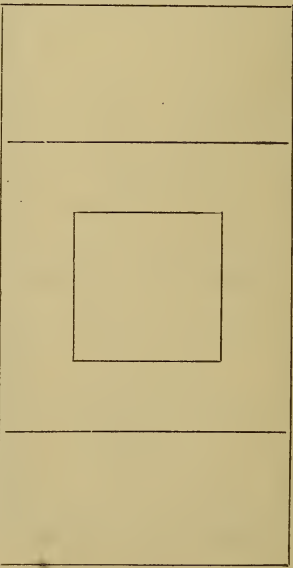
6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



THIRD CLASS TARGET.

SECOND CLASS TARGET.

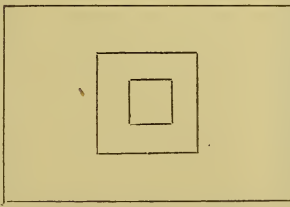
FIRST CLASS TARGET.

Date, _____ Time, _____
Wind—Direction of, _____ Force of, _____
Weather, _____ Cartridges, _____
Rifle, _____
Elevation, _____

Yds.	1	2	3	4	5	6	7	8	9	10	Total.
Yds.											
Yds.											

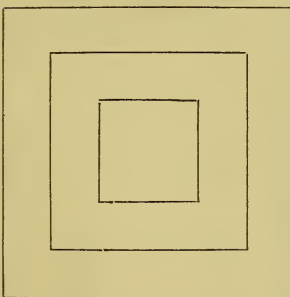
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



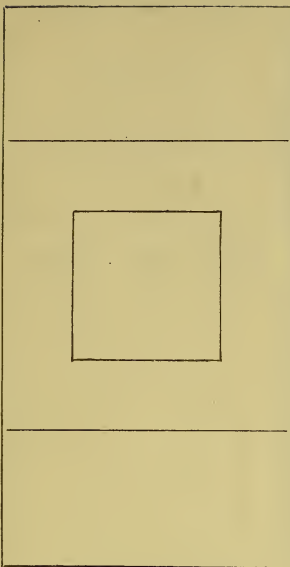
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

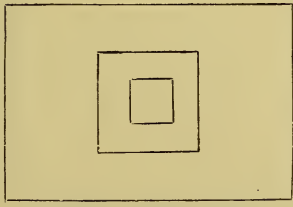


FIRST CLASS TARGET.

Date,	Time,	Wind—Direction of,	Force of,	Total.																
				1	2	3	4	5	6	7	8	9	10							
				Yds.																
				Yds.																
				Yds.																

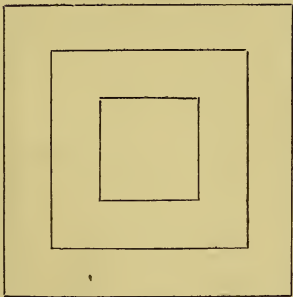
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



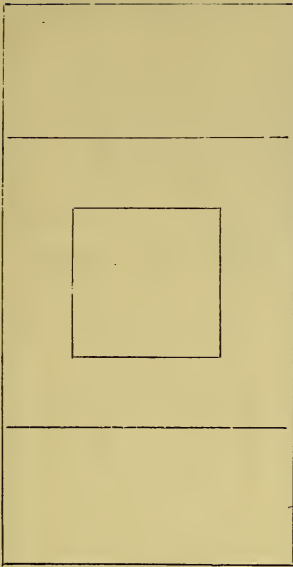
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

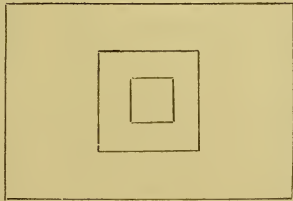


FIRST CLASS TARGET.

Date,	Time,	Wind—Direction of,	Force of,												
				Yds.	1	2	3	4	5	6	7	8	9	10	Total.
				Yds.											
				Yds.											

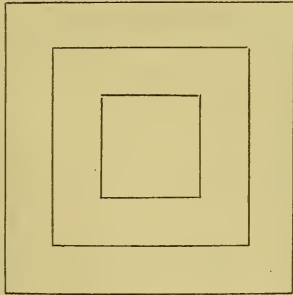
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



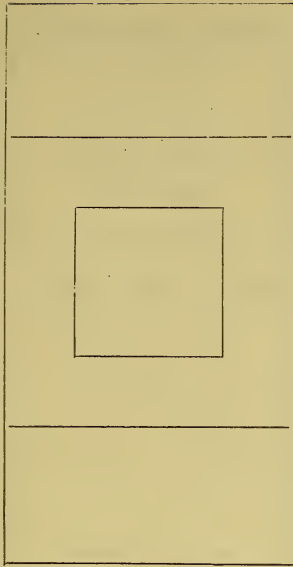
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



FIRST CLASS TARGET.

Date,

Wind—Direction of,

Weather,

Rifle,

Elevation,

Remarks.

Time,

Force of,

Cartridge,

1 2 3 4 5 6 7 8 9 10 Total.

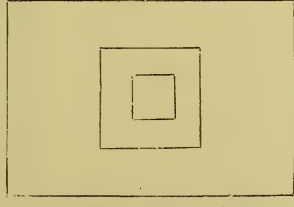
Yds.

Yds.

Yds.

6 feet by 4 feet.

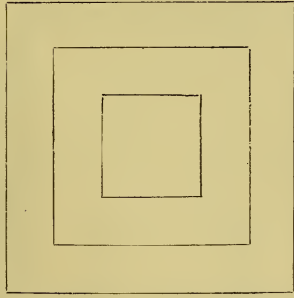
Centre, 2 feet square.
Bullseye, 8 inches square.



THIRD CLASS TARGET.

6 feet square.

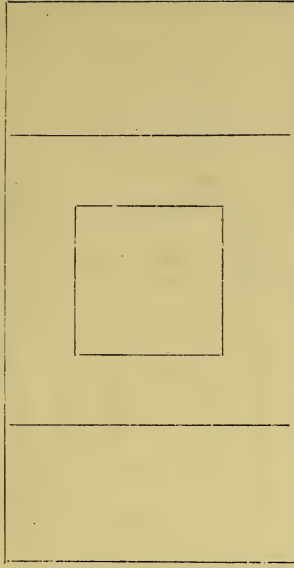
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.

Centre, 6 feet square.
Bullseye, 3 feet square.

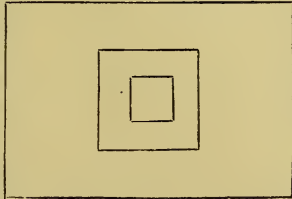


FIRST CLASS TARGET.

	1	2	3	4	5	6	7	8	9	10	Total.
Date,											
Wind—Direction of,											
Weather,											
Rifle,											
Elevation,											
Time,											
Force of,											
Cartridge,											
Yds.											
Yds.											
Yds.											

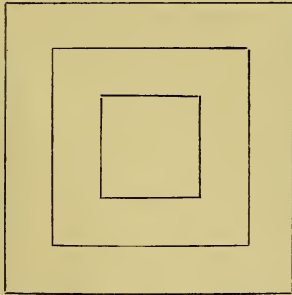
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



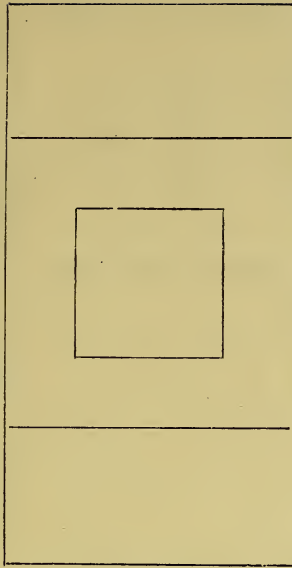
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

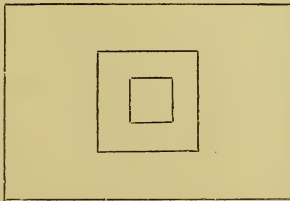


FIRST CLASS TARGET.

Date,	Time,	Force of,	1	2	3	4	5	6	7	8	9	10	Total.
Wind—Direction of,			Yds.										
Weather,			Yds.										
Rifle,		Cartridge,	Yds.										
Elevation,													

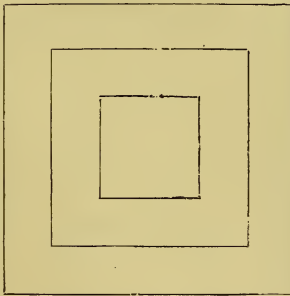
Remarks.

5 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



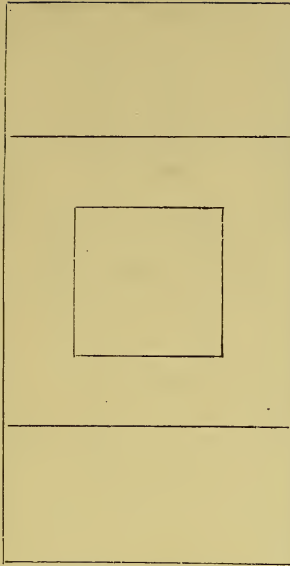
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

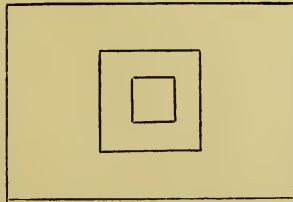


FIRST CLASS TARGET.

Date,	Time,	Wind—Direction of,	Force of,	Weather,	Rifle,	Elevation,	Total.														
							1	2	3	4	5	6	7	8	9	10					
							Yds.														
							Yds.														
							Yds.														

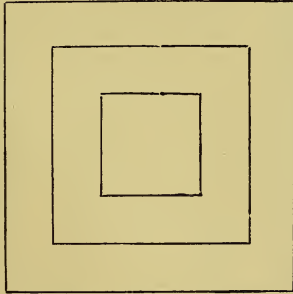
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



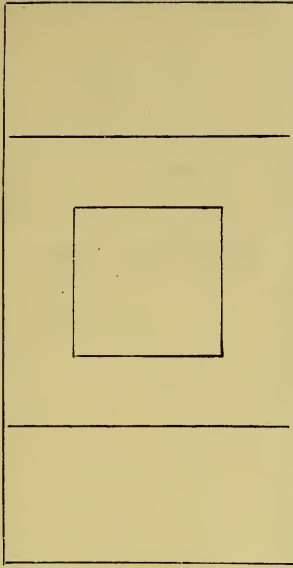
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

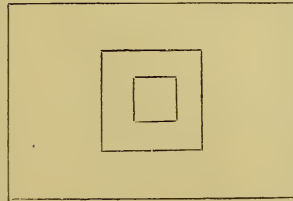


FIRST CLASS TARGET.

Date,	Time,	Wind—Direction of,	Force of,	1	2	3	4	5	6	7	8	9	10	Total.
				Yds.										
				Yds.										
				Yds.										

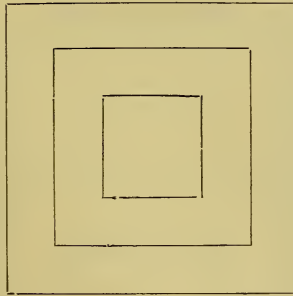
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



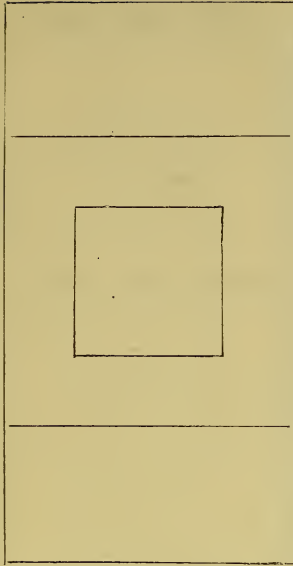
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

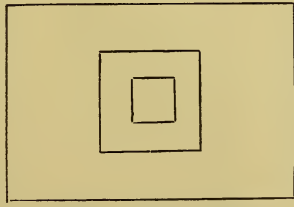


FIRST CLASS TARGET.

Date,	Wind—Direction of,	Weather,	Rifle,	Elevation,	Time,	Force of,	Total.														
							1	2	3	4	5	6	7	8	9	10					
							Yds.														
							Yds.														
							Yds.														

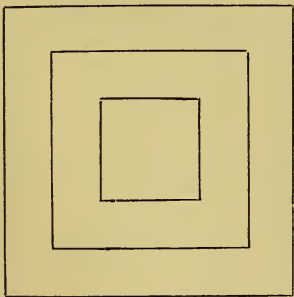
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



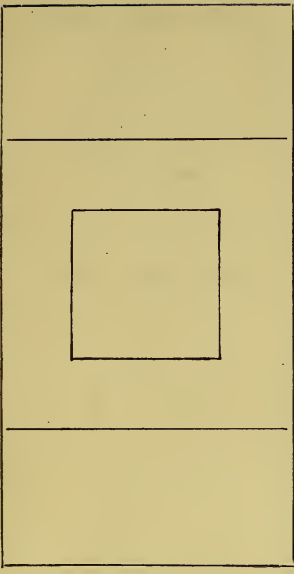
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



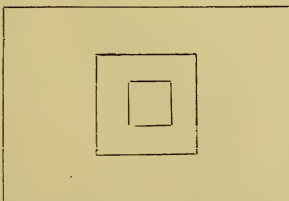
FIRST CLASS TARGET.

	1	2	3	4	5	6	7	8	9	10	Total.
Yds.											
Yds.											
Yds.											

Date, _____ *Time,* _____ *Force of,* _____
Wind—Direction of, _____
Weather, _____ *Cartridge,* _____
Rifle, _____
Elevation, _____

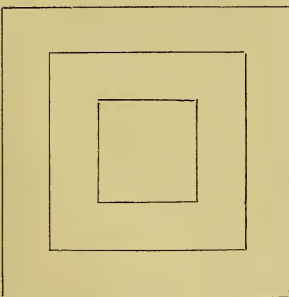
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



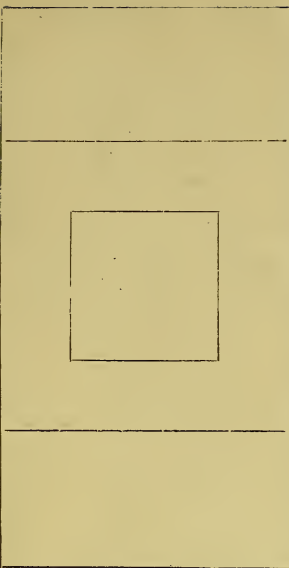
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.

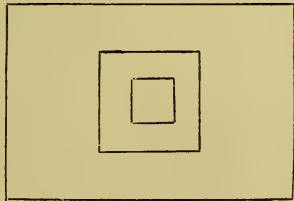


FIRST CLASS TARGET.

Date,	Time,	Wind—Direction of,	Force of,	Total.																
				1	2	3	4	5	6	7	8	9	10							
				Yds.																
				Yds.																
				Yds.																

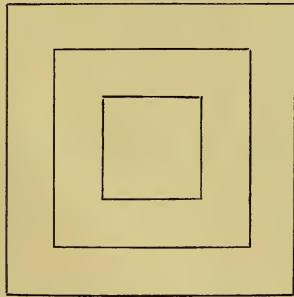
Remarks.

6 feet by 4 feet.
Centre, 2 feet square.
Bullseye, 8 inches square.



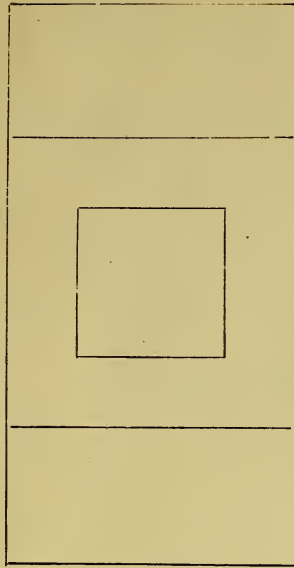
THIRD CLASS TARGET.

6 feet square.
Centre, 4 feet square.
Bullseye, 2 feet square.



SECOND CLASS TARGET.

6 feet by 12 feet.
Centre, 6 feet square.
Bullseye, 3 feet square.



FIRST CLASS TARGET.

Date,	Wind—Direction of,	Time,	Force of,																	
				1	2	3	4	5	6	7	8	9	10	Total.						
	W.ether,			Yds.																
	Rifle,		Cartridge,	Yds.																
	Elevation,			Yds.																

Remarks.

TELESCOPES FOR RIFLE PRACTICE,

OF SUPERIOR QUALITY.

BINOCULAR FIELD-GLASSES,

Of extraordinary power, with which shot-marks are discernable
at the longest ranges.

WALDSTEIN, OPTICIAN,

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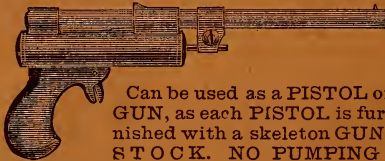
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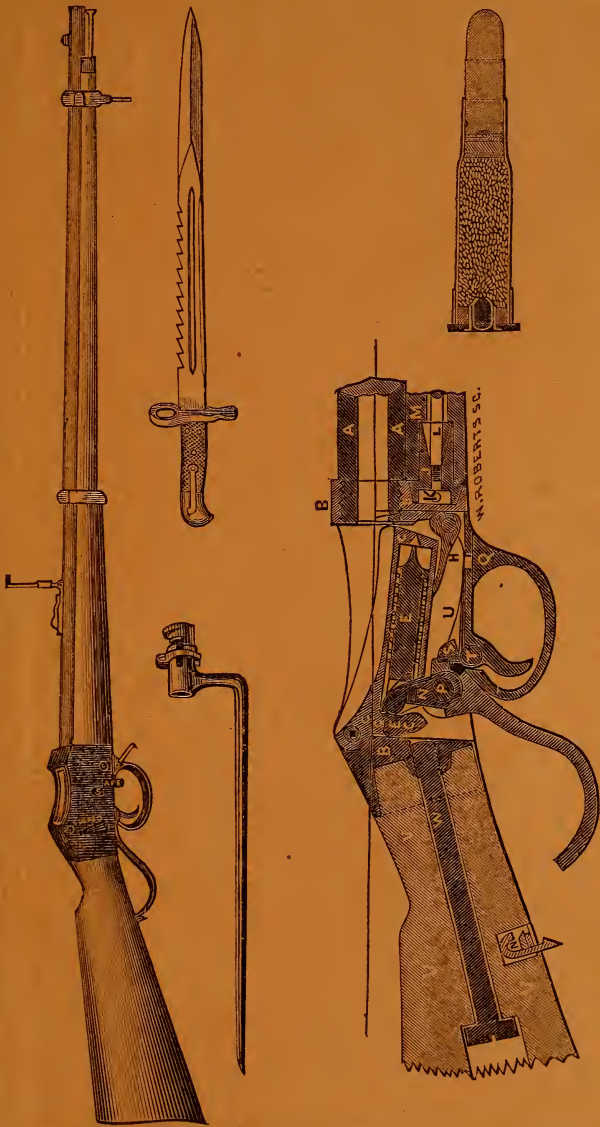
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