UNITED STATES ARMY
MARKSMANSHIP UNIT

UNITED STATES ARMY

E PLURIBUS UNUM

SHOOTING TEAM

BASIC *Smallbore Rifle* GUIDE

FOREWORD

The purpose of this publication is to provide a guide to fundamentals, principles and techniques of rifle marksmanship for the beginning smallbore rifle shooter. Information given herein comes from the United States' gold, silver, and bronze medal winners of the Olympics, Pan American Games, World Championships and the Tournament of the Americas.

This guide covers shooting safety, equipment, techniques and positions. If the beginning shooter develops a stronger interest in target shooting and desires to improve his shooting techniques, positions and to learn more about proper shooting equipment, the USAMU recommends reading the International Rifle Marksmanship Guide (available by writing to the Commander, USAMU, Fort Benning, Georgia 31905).

For those who will be instructing the beginning shooters, please keep in mind that the two primary objectives of this guide and the program of instruction are to give the beginner an awareness of firearms safety and an appreciation for the sport of shooting. Don't expect good scores immediately. Emphasize the fundamentals and techniques continuously. Be patient with the youngsters' learning abilities. Insist on safety at all times.

STANLEY J. PARMENTIER
Colonel, Infantry
Commanding

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Figure 1.

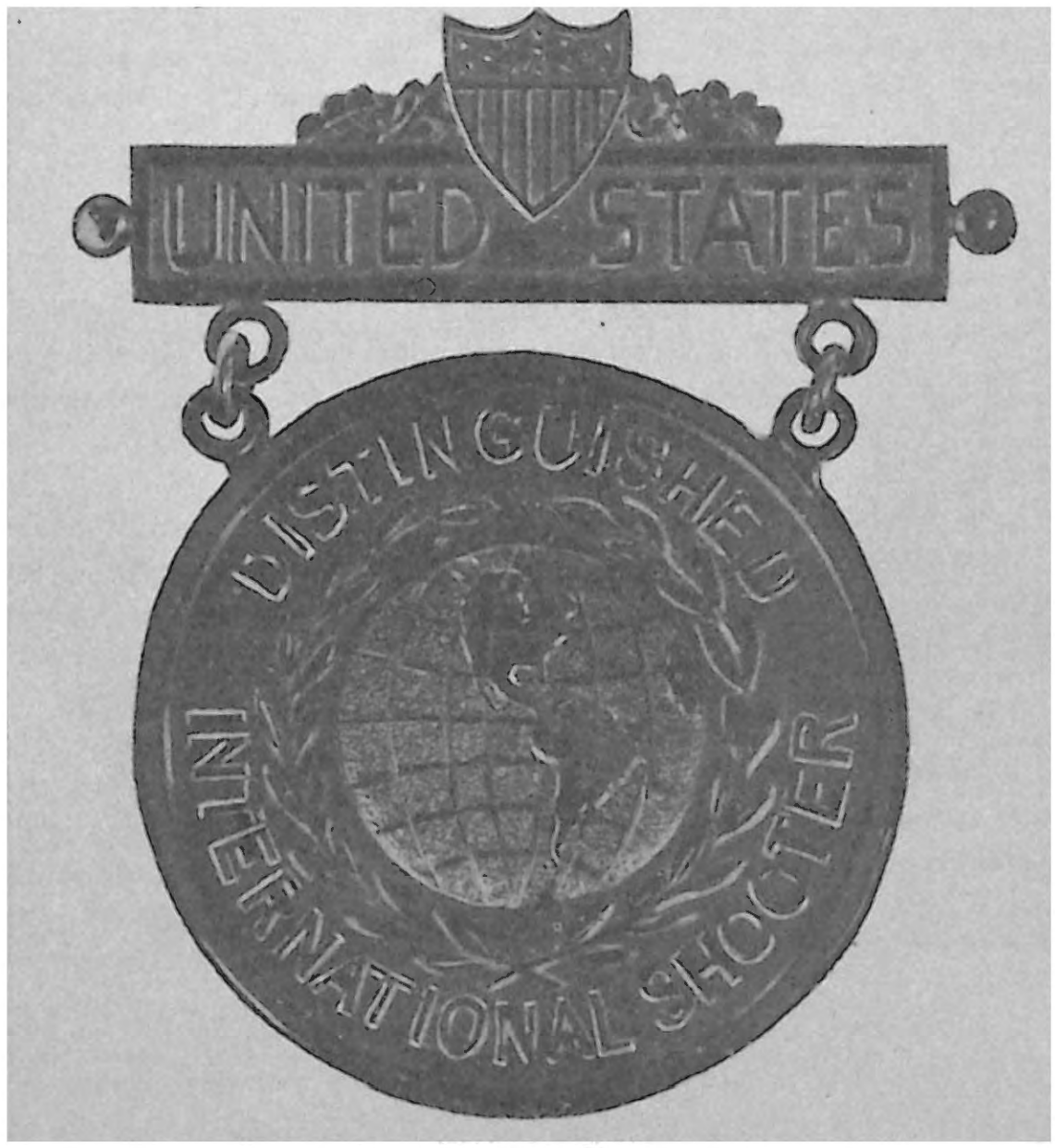


Figure 2.

SECTION I

THE NATIONAL AND INTERNATIONAL MATCHES

A. GENERAL: The two medals in Figures 1 and 2 have one thing in common, both are awarded only to the finest shooters in the world. The International Distinguished Award is the highest award this nation can bestow upon a marksman. This medal is awarded to a shooter when he receives his first medal in international world competition. The Olympic Gold Medal is awarded of course to the champion at the Olympics.

World Medals are given in only five competitions:

1. The Olympic Games are the most difficult competitions in which to win a medal. Only individual medals are given, i.e., only one gold, silver, and bronze per event. Also the U.S. team is composed of only four individuals selected at a tryout, normally run concurrently with the National International Championships. Only two shooters compete in each event from each nation.

2. The Pan American Games, unlike the Olympics are open only to nations in North, South, and Central America. Four man team awards are also presented, and for this reason normally eight shooters are selected for this competition. Although four shooters fire in each event, only two can shoot for the individual medal and they are selected prior to firing.

3. The World Championships, open to all nations, includes all six international events. Normally four 300 meter and four 50 meter shooters are selected with one alternate. All shooters are eligible to win both an individual and a team medal. Each of the above events are held once every four years and are so spaced that two do not fall on the same year.

4. The Championship of the Americas like the Pan American Games is only open to nations in North, South and Central America.

5. The European Championships are open to all nations of Europe and basically everyone who is excluded from the Pan American Games. Normally fired biannually, this competition is conducted exactly like the World Championships.

B. MAJOR DIFFERENCES BETWEEN ISU AND NRA TYPE MATCHES:

1. Time: National Rifle Association (NRA) matches require the competitor to shoot his positions in a limited amount of time, one minute per shot. International Shooting Union (ISU) matches allow a longer period of time for the shooter to work and concentrate on his performance. There is no need to hurry the shot.

2. Targets: The target black of the ISU and NRA targets are almost identical. However, the scoring rings on the ISU target are considerably smaller than those on the NRA target. Thus, the ISU target is more demanding on the shooters. It is a more discriminating measure of performance than the NRA target (Figure 3).

3. Firing Points: In ISU matches, firing points are usually covered and enclosed on three sides. The purpose of this is to protect the shooters from the elements (Figure 4). Also, all shooters are equally protected, this is not always true in NRA matches when trees or buildings behind an open firing line protect some shooters from wind, while other shooters go unprotected.

4. Positions: ISU fires only in prone, standing and kneeling. NRA fires prone, sitting, kneeling and standing.

NOTE: All photographs in this manual which are not specifically mentioned in the text are for additional shooter reference.

a. NRA 50 FOOT TARGET

b. ISU 50 FOOT TARGET

Figure 3.

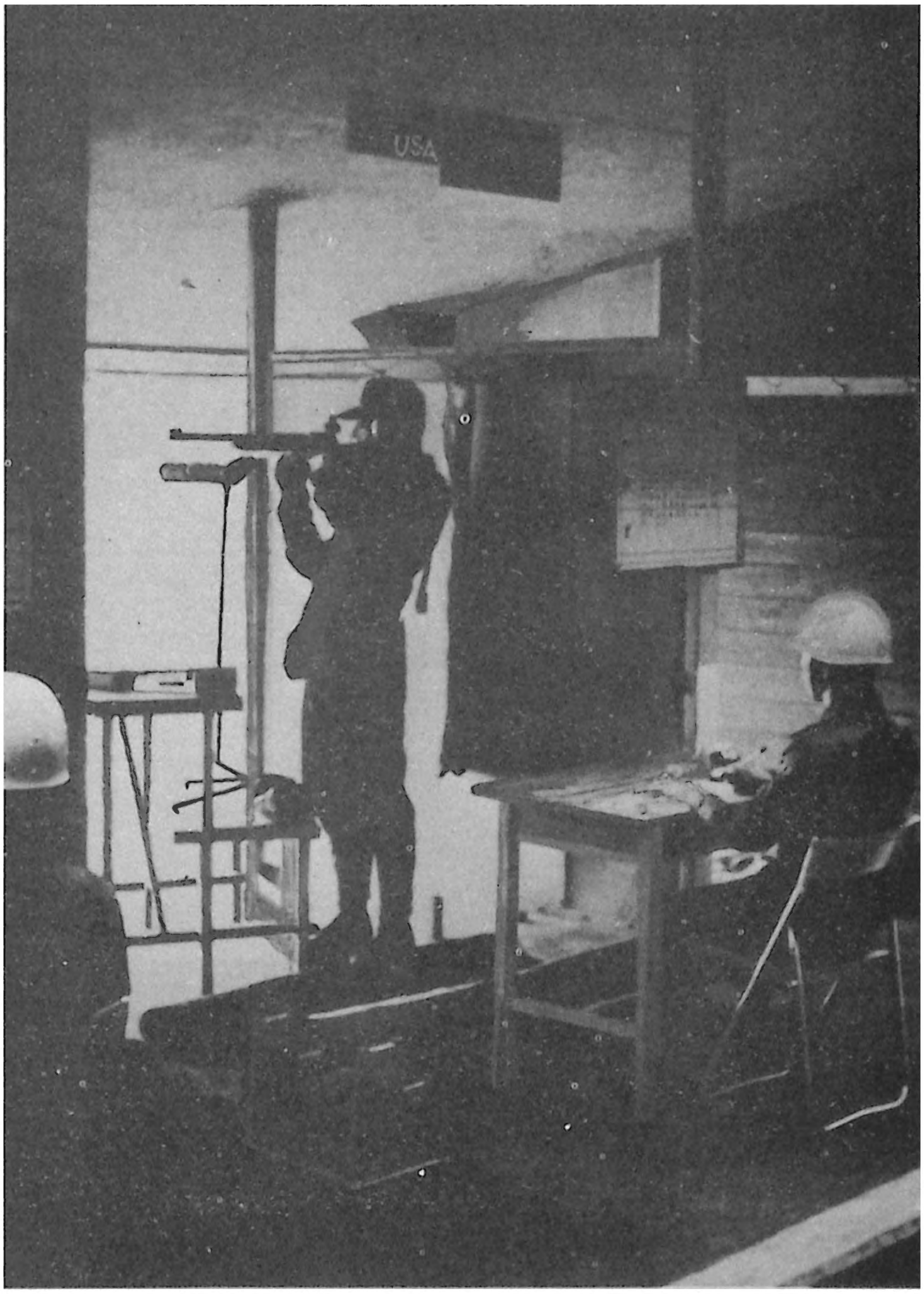


Figure 4.

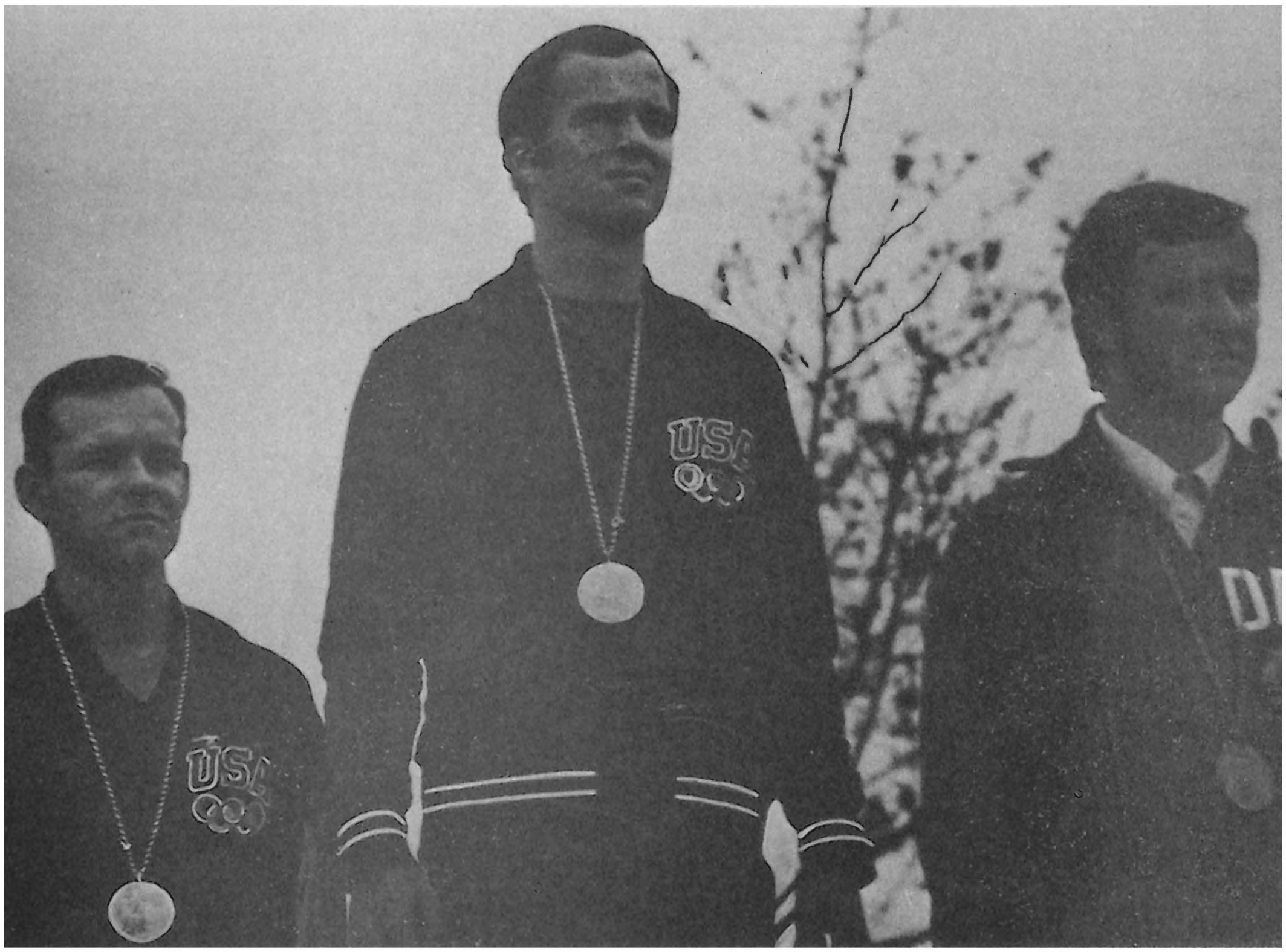


Figure 5. XX Olympiad Award Ceremony
Munich, West Germany, 1972

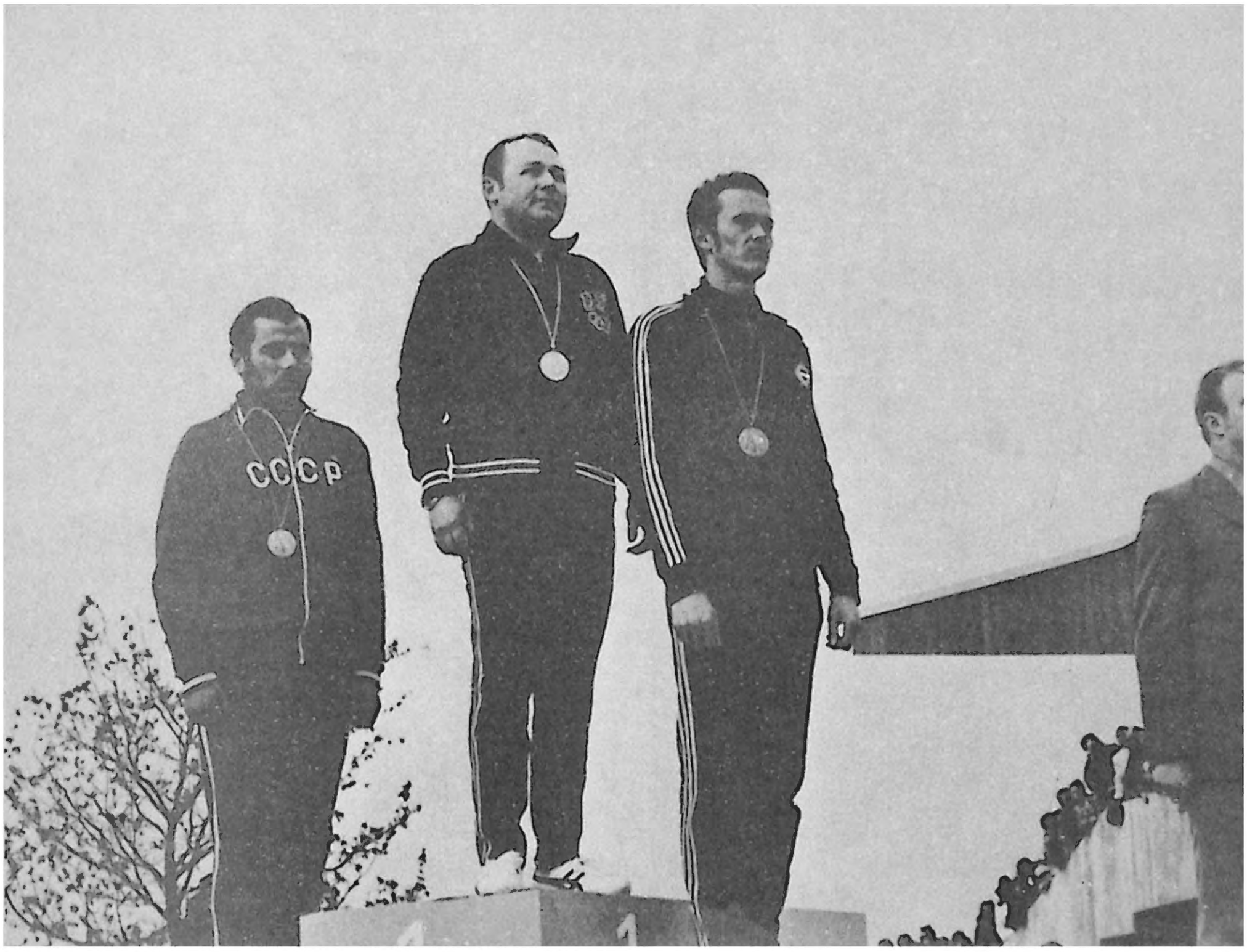


Figure 6. XX Olympiad Award Ceremony
Munich, West Germany, 1972

Figure 7. XX Olympiad Award Ceremony
Munich, West Germany, 1972

SECTION II

SHOOTING SAFETY

A. The most important principles the beginning shooter should learn are those concerning safety. Therefore, before any individual is exposed to the use of firearms in this manual a guide to the safe handling of rifles is given below.

1. Treat each gun as if it is loaded.

2. Follow all commands given by the range officer. Especially "Cease Firing" and "Commence Firing". (Figure 8)

3. Always hold the rifle so that it is pointed in a safe direction. Usually this is in the air or down range.

4. Be sure of your target before you shoot.

5. Be sure of your backstop.

6. Never point a gun at anything you would not want to shoot.

7. Don't climb trees or fences with a loaded rifle.

8. Shooting at flat hard surfaces and water causes ricochets. Never shoot at these.

B. Each shooter should protect his hearing and vision. Always wear ear plugs or muffs, even the sound from a .22 caliber rifle can damage hearing. Shooting glasses with hardened lenses should be worn, especially when shooting high powered rifles. These glasses will protect the eyes from gas blow back in case of a ruptured primer or cartridge case. (Figure 9)

Figure 8.

Figure 9.

SECTION III

SHOOTING EQUIPMENT

A. GENERAL: The rifle and accessories you will use are not as specialized as those used by the medal winners pictured earlier in the manual. However, they began their many years of shooting with equipment similar to yours.

B. THE RIFLE: In four position NRA shooting the beginning shooter actually uses a rifle like the one in Figure 10. This rifle has several parts common to all rifles. There is the stock which has a butt plate to rest against the shooter's shoulder, a pistol grip and the fore-end. In the stock is the trigger assembly, action (receiver) and bolt, and the barrel. At the rear and on top of the action is a rear sight and at the muzzle of the barrel is the front sight. Sights are discussed in Section IV.

C. ACCESSORIES FOR THE BEGINNING SHOOTER: (Figures 11-14)

1. Jacket: This can be made of light weight canvas or of a similar strong material with elbow pads, a shoulder pad and sling pad attached. The jacket provides some support and additional comfort to the shooter (Figure 11).

2. Shirts: Wearing heavy sweaters or sweatshirts is recommended in order to reduce the effects of pulse beat and muscle tremors which would otherwise be transmitted to the rifle. Extra shirts are recommended if a jacket is not available (Figure 11).

3. Glove: A glove is worn by the shooter to reduce the pressure caused by pushing the hand forward against the sling and fore-end stop (Figure 11).

4. Sling: The sling aids in supporting the rifle. A leather sling is preferred over a web sling since it won't stretch in length as much as the web (Figure 12).

5. Kneeling Roll: The kneeling roll can be made of cloth or leather and be filled with sand, sawdust, or any other suitable material. The roll must be no more than 8 inches long and 7 inches in diameter. The roll should conform to the individual shooters position and instep (Figure 12).

6. Shooting Mat: The mat should be thin and have a nonskid surface for the shooter's elbows (Figure 12).

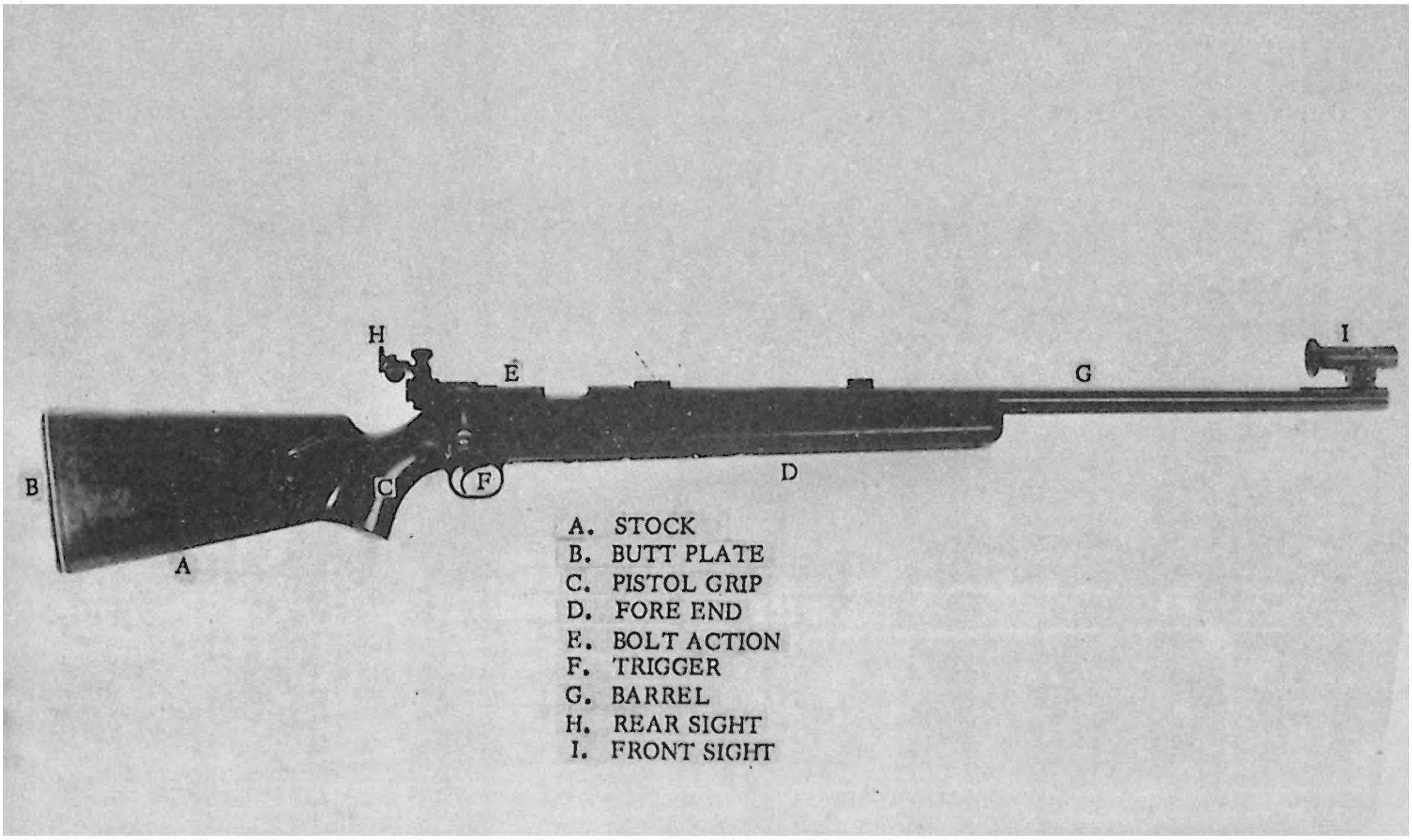
7. Boots: Boots provide support for the ankles and give a solid base for positions which street and tennis shoes don't give.(Figure 11).

8. Spotting Telescope with Stand: A telescope gives the shooter a means of spotting his shot. The scope also can be used to study mirage. It should be equipped with a tripod or bipod stand capable of adjustment for each shooting position. Most shooters use a telescope with a magnifying power between 20X and 30X (Figure 13).

9. Loading Block: The ammunition loading block not only serves to keep the ammunition clean, but is helpful to the shooter in counting the number of shots fired. The block is usually constructed in wood or plastic with a capacity of holding 50 to 100 rounds (Figure 13).

10. Shooting Notebook (Diary): Every shooter should keep a notebook to record information he has found to be helpful to his performance. This notebook may include concrete information such as sight setting for specific range zeros as well as experimental ideas or psychological conditions which the shooter has formulated. It is important that these facts, ideas, and personal techniques be promptly recorded rather than left to memory. This information can provide the key to consistent improvement and good scores (Figure 13).

11. Cleaning Rod and Materials: The cleaning rod should be a one piece steel rod coated with a plastic material softer than the rifle barrel. In order to maintain a high degree of accuracy and correct rifle function, proper cleaning materials are required. These materials may include: Bore brushes, cloth patches, solvent, lubricant, bolt brush, rust inhibitor, and cleaning rod guide. Arms manufacturers recommend regular cleaning to maintain maximum accuracy of their rifles (Figure 14).



A. STOCK
B. BUTT PLATE
C. PISTOL GRIP
D. FORE END
E. BOLT ACTION
F. TRIGGER
G. BARREL
H. REAR SIGHT
I. FRONT SIGHT

Figure 10.

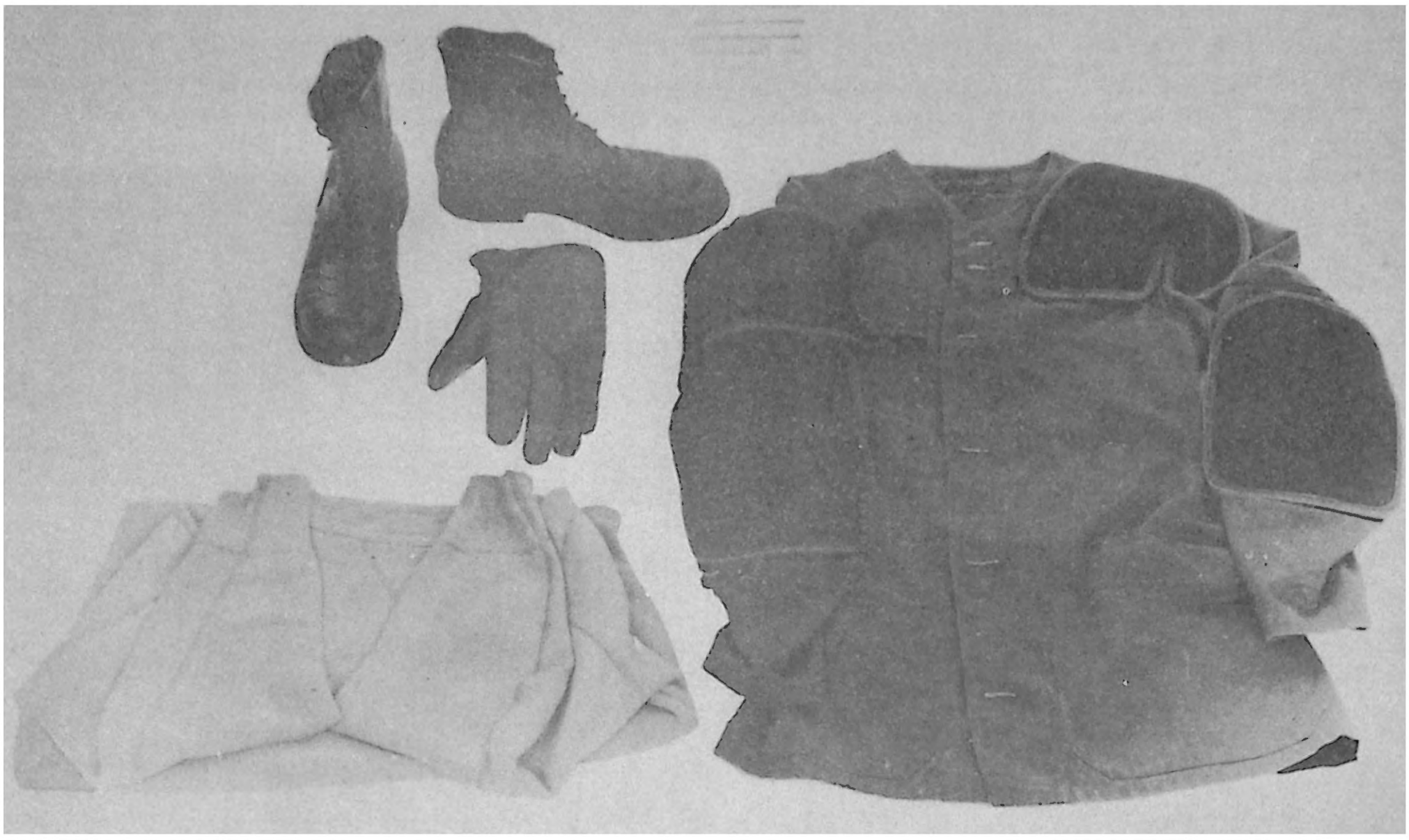


Figure 11. Clothing.

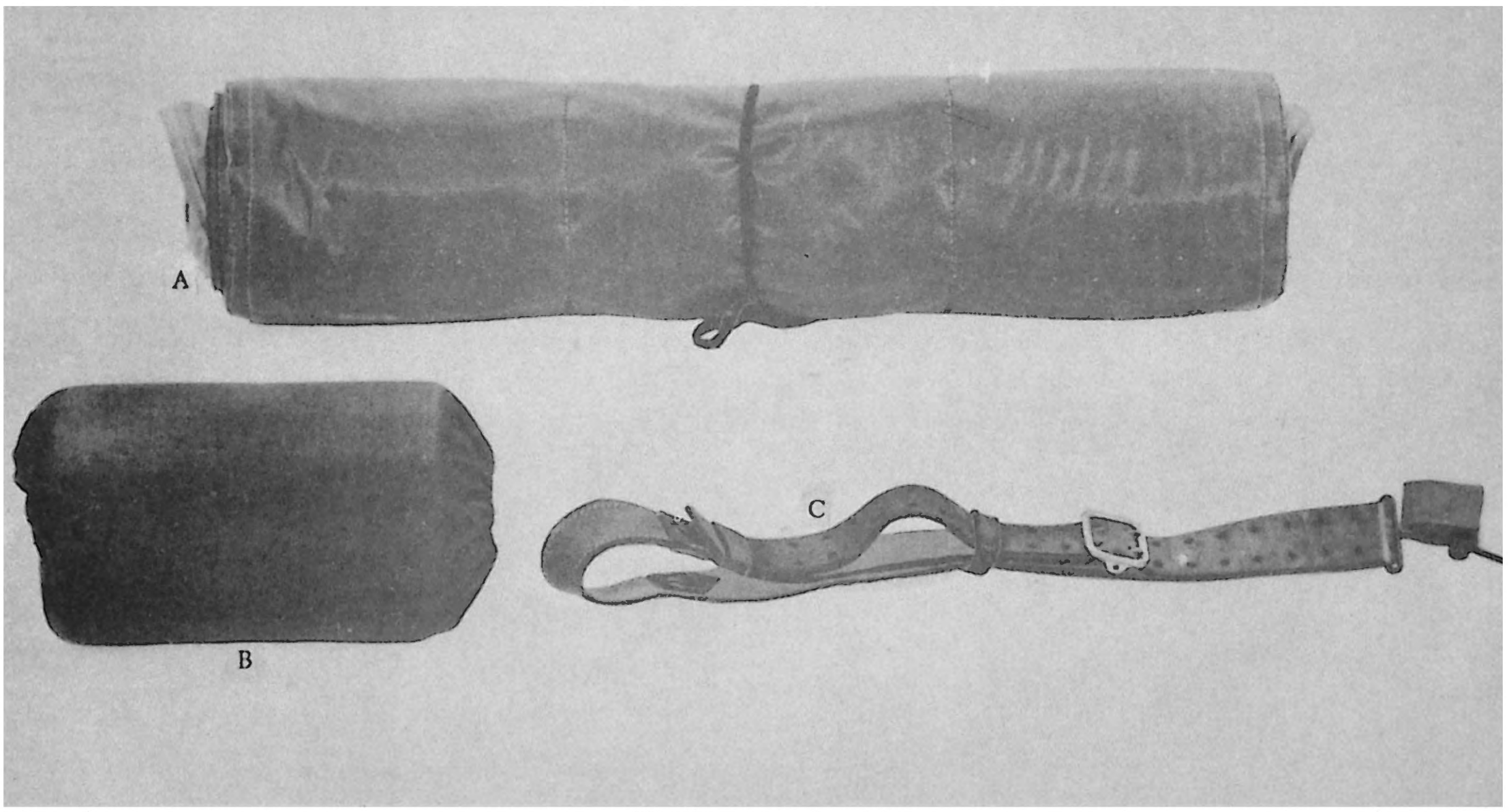


Figure 12. A. Mat.
B. Kneeling.
C. Sling.

Figure 13. A. Ear plugs and ear protectors.
B. Spotting scope.
C. Diary.
D. Loading block.

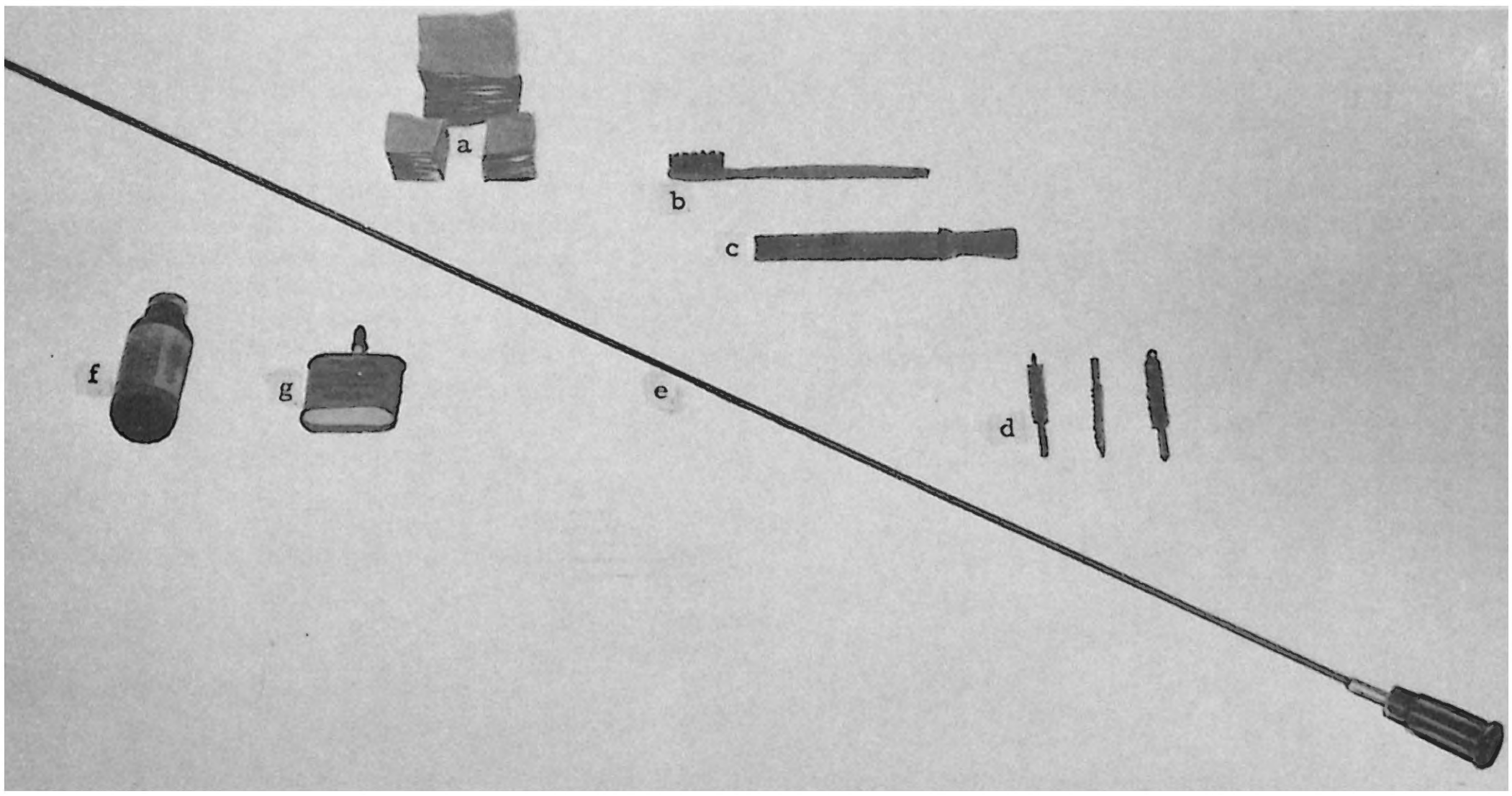


Figure 14. a. Cleaning patches.
b. Brush.
c. Cleaning rod guide.
d. Rod brushes.
e. Cleaning rod.
f. Solvent.
g. Oil.

SECTION IV

THE INTEGRATED ACT OF FIRING

A. GENERAL: In this section we are going to consider several of the factors that must be integrated to produce the total act of firing a shot. The reader should bear in mind that we consider each factor separately only for ease of discussion. All converge and are coordinated at a single moment to produce the shot.

B. SHOOTING METHOD: It is relatively easy to talk or write about correct shooting methods. To put these methods into practice is vastly more difficult. It is because of this challenge that shooting fascinates so many thousands of people.

The shooting method USAMU shooters use is that of holding the rifle in the 10-ring and activating the trigger without disturbing the rifle. This method requires the shooter to develop his ability to hold the rifle perfectly still. Beginning shooters will find their rifle moves very much but with practice this movement becomes smaller.

C. BREATH CONTROL:

1. General: The breathing process provides the body with oxygen and eliminates waste elements from the blood. Correct breathing while shooting is essential to proper body functions.

2. A complete respiratory cycle lasts 4-5 seconds (Figure 15). Inhalation and exhalation require only about 2 seconds. Thus between each respiratory cycle there is a pause of 2-3 seconds. This pause can be extended to 6-8 seconds without any special labor or unpleasant sensations. It is during an extended pause between breaths that the rifleman should fire the shot. The reason is that during the respiratory pause the breathing muscles are relaxed and the shooter avoids strain upon the diaphragm. Also his concentration is not broken by thinking of the need to breathe.

3. Holding the Breath:

a. When a beginning shooter is told that holding his breath will assist in steadying the rifle, he may instinctively relate this action to holding his breath in the manner that he would prior to swimming under water. Inhaling deeply and holding the air in the lungs is NOT a correct procedure in marksmanship.

b. A shooter should assume his position and breathe naturally until his hold begins to settle. He then takes a slightly deeper breath; then breathes out and pauses, expecting to fire the shot during the pause. If the hold does not settle sufficiently to allow the shot to be fired, the shooter resumes normal breathing and repeats the process. The technique is graphically portrayed below.

4. The respiratory pause should never feel unnatural. If the pause is extended for too long a period, the body suffers from oxygen deficiency and sends out signals to resume breathing. These signals produce slight involuntary movements in the diaphragm and interfere with the shooter's ability to concentrate. Generally speaking, 6-8 seconds is the maximum safe period for the respiratory pause to fire a shot.

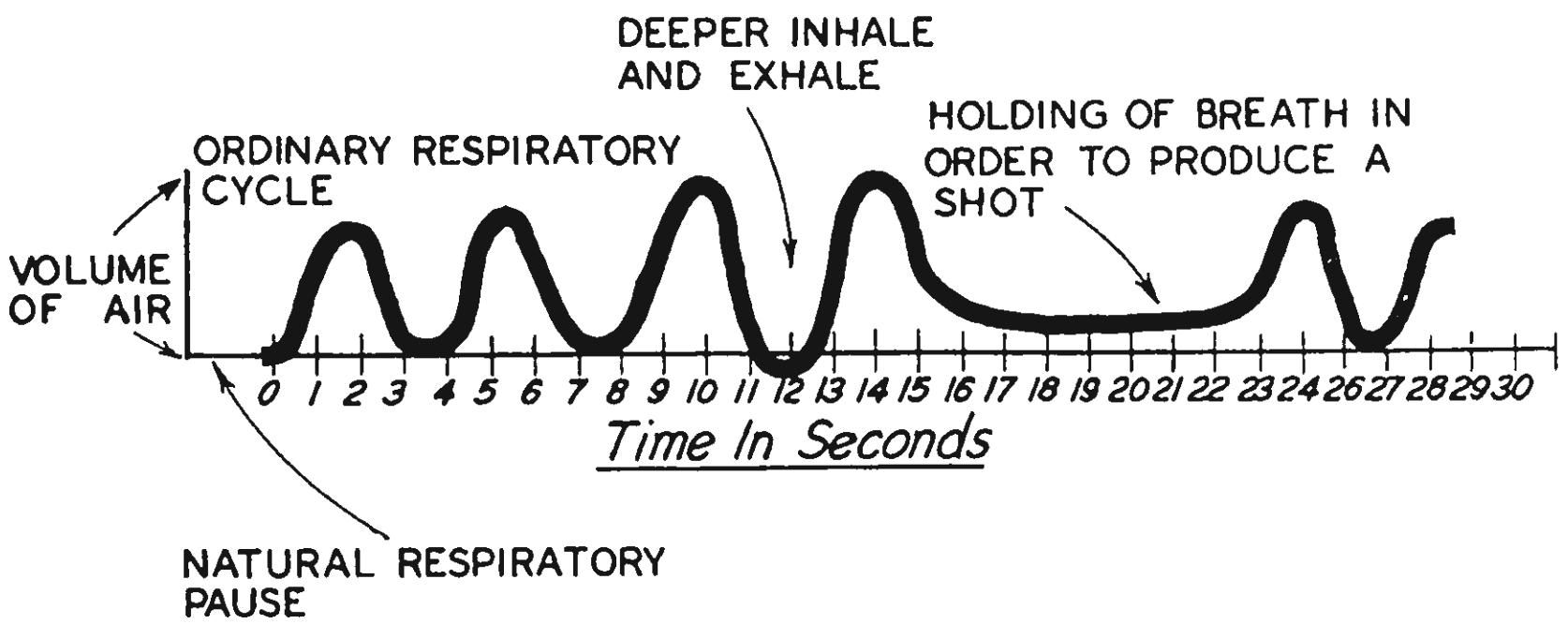


Figure 15. Respiratory cycle.

D. THE EYE AND THE SIGHT SYSTEM:

1. General: The shooter need not concern himself with a scientific knowledge of the eye. He should be concerned only that his eyes are healthly, that he can see clearly, and that he uses his eyes properly while shooting. A layman should never attempt to prescribe or administer treatment to defective or injured eyes. A shooter (or anyone) with eye problems should consult a vision specialist. Corrective lenses in no way impair a shooter's ability. Some of the world's best marksmen shoot with corrected vision. It should also be remembered that a particular set of sights that provides maximum clarity to one shooter's eyes may not provide the same clarity to another shooter's eyes.

2. Proper Use of the Eyes: While shooting, an individual should remember the cardinal principles in the proper use of his eyes:

a. Look as straight forward as possible out of the eye socket. If the head position causes the shooter to look across the bridge of his nose or out from under his eyebrow, the eye muscles will be strained. This strain will produce involuntary eye movements which reduce the reliability of vision. This will not only affect performance, but the inability to see well will also have a damaging psychological effect upon the shooter. The eyes will function best in their natural, forward-looking position.

b. Do not fix vision on the sight picture for more than several seconds. When the eyes are focused on a single image for a time, the image is "burned" into the area of perception. This effect upon the shooter's eyes is quite important. A burned sight picture will dull acuity in the critical area of perception; and this image may possibly be mistaken for a true sight picture. Either effect will seriously damage performance.

c. Normally, the best use of the eyes is derived when the shooter keeps both eyes open while firing. It is natural for the eyes to work as a refined team. If one eye is squinted or closed the other eye will have a tendency to want to do the same. With both eyes open the shooter also finds it easier to check the wind flags on the range while the rifle is in the aiming position.

d. On occasion there will be a shooter whose aiming eye is not his dominant eye. In this case it might prove helpful to use a blinder. In fact, most shooters do use a blinder regardless of their dominant eye. This tends to decrease visual distractions and increase concentration. Side lighting may also be distracting to the shooter under some light conditions. If harsh light becomes annoying, a blinder may be used here again. Such a blinder may be attached to the shooting glasses or hat brim. The preferred blinder is one that is attached to the rifle in the vicinity of the rear sight. In this manner, the left eye will remain open but the blinder will block out the view down range.

3. Focus of the Eye:

a. Many shooters contend that the shooter should focus his shooting eye on the front sight; that seeing the front sight or aperture clearly and distinctly is the most important visual aspect in sighting. This is not necessarily true. Most young shooters have the capability of seeing both the front sight and target bull with equal clarity. This capability is referred to as "accommodation." When aiming the shooters eye is continuously changing focus from the front sight to the target and back to the front sight. The eye focuses back and forth so rapidly that it appears to the shooter that both images are seen with equal clarity.

4. The Sight System:

a. Proper sight alignment can be defined as the process of perfectly centering the front sight in the rear aperture. (Figure 16)

b. Sight picture contains the same two elements of sight alignment (front and rear sights) with the addition of the bull or target image. A perfect sight picture exists when the sights are properly aligned and the bullseye centered in the front aperture or properly positioned on the post. (Figure 16)

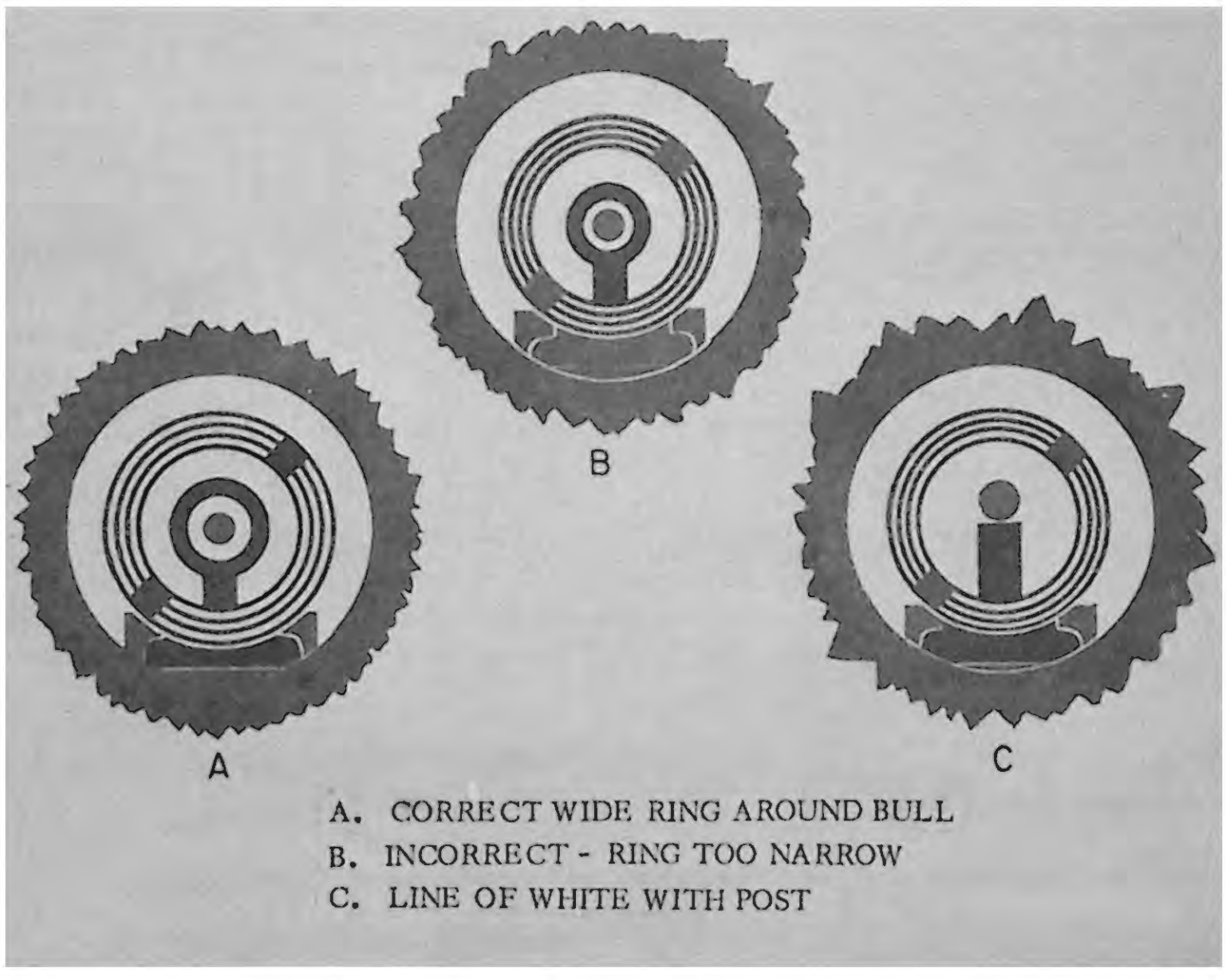


Figure 16.

5. The Front Sight: The universally accepted front sight consists of a tubular mount containing a removable insert (Figure 17). The most frequently used inserts are the post and the aperture.

a. The Aperture: The aperture is the more popular insert. The most common error is the use of an aperture that is too small. Generally speaking, the diameter of the aperture should appear to be about 1 - 1 1/2 times the diameter of the target black. However, this is only a guide. The optimum size aperture is the one that reveals a wide line of white around the bull's-eye and allows the target to stand out in clear definition against this white background (Figure 16).

b. The Post: The post should appear to be the same width as the black portion of the target. (Figure 16) The post should approach the target from 6 o'clock, the bottom of the bull. If the rifle is canted, the insert should be altered to compensate for the angle of cant so that the post still approaches the bull's-eye from 6 o'clock. There are two methods of using the post: (1) the 6 o'clock tangent hold, in which the bull's-eye appears to rest on the top of the post; and (2) the 6 o'clock line - of - white hold, in which a narrow line of white is visible between the top of the post and the bottom of the bull's-eye. Both methods are in general use. However, because of the difficulty of the target and the long course of fire, the line - of - white hold has proven to be the best for the smallbore shooting. The tangent and line - of - white methods both require extremely keen eyesight. Most good shooters who use a post have better than 20/20 vision (natural or corrected) and a shooter should consider his visual acuity in making a choice between aperture and post.

6. The Rear Sight:

a. Mechanically, the rear sight should be rugged, tight, and firmly attached. It should be capable of finely graduated adjustments (1/4 or 1/8 minutes of angle). The adjustment mechanism should be free of slack and should move precisely the same distance with each click of adjustment. The sights should be protected at all times, but especially when being transported (Figure 17).

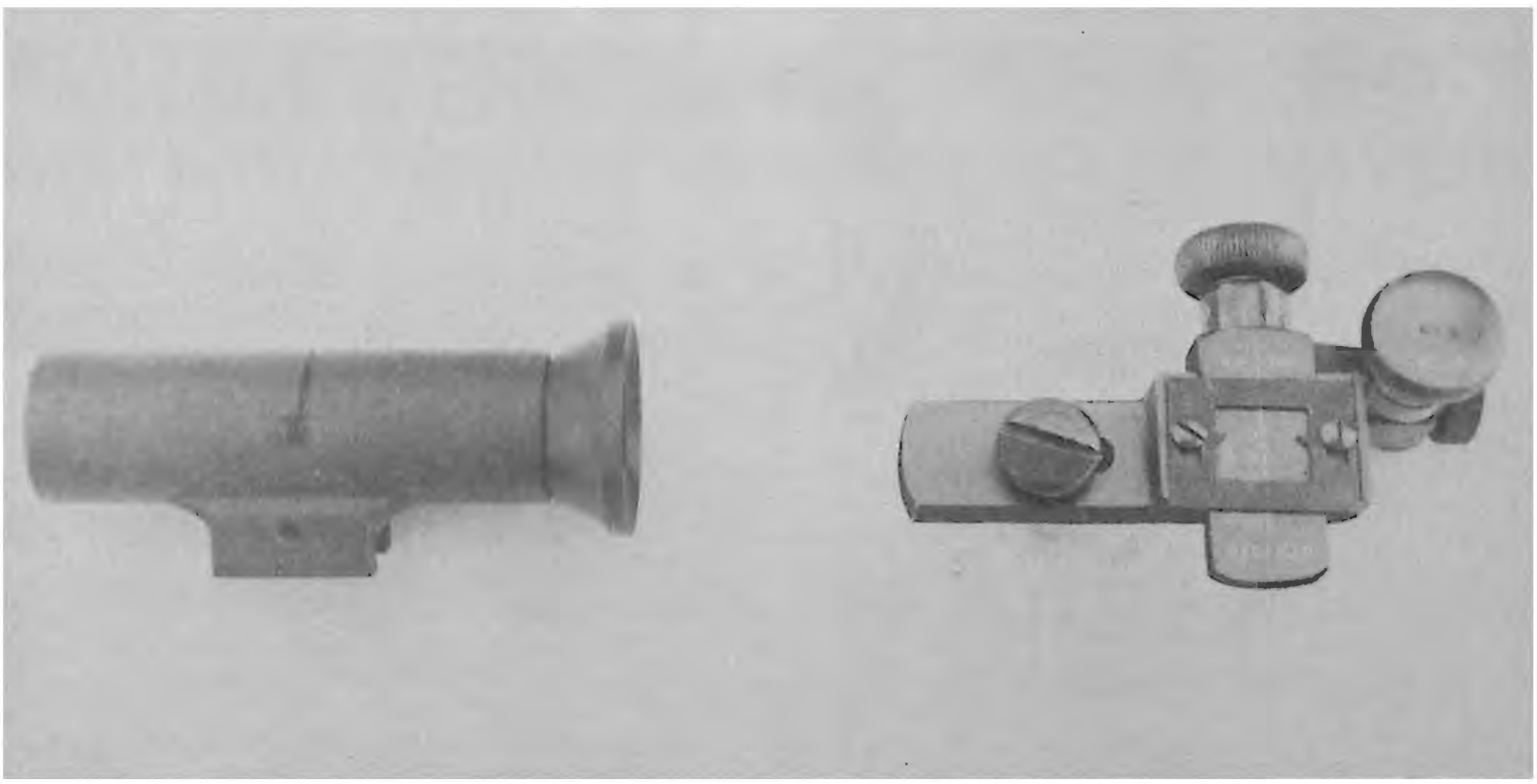


Figure 17. Tubular front sight and aperture rear sight.

7. Eye Relief: Eye relief is the distance between the eye and the rear sight (Figure 18). There is no measured distance that is correct eye relief for all shooters. In many cases it is controlled by the construction of the equipment.

a. The position of the sight should result in the shooter assuming a natural upright position. The sight should be adjusted to the head position, and not the head position to the sight.

b. Eye relief should feel comfortable to the shooter. The rear sight should not be so close that the shooter worries about recoil; and it should not be so far from the eye that he must strain to receive a clear sight picture. Some shooters prefer close eye relief, others distant relief. Average eye relief is about 2-6 inches. Each shooter must adjust eye relief to fit his own eye characteristics.

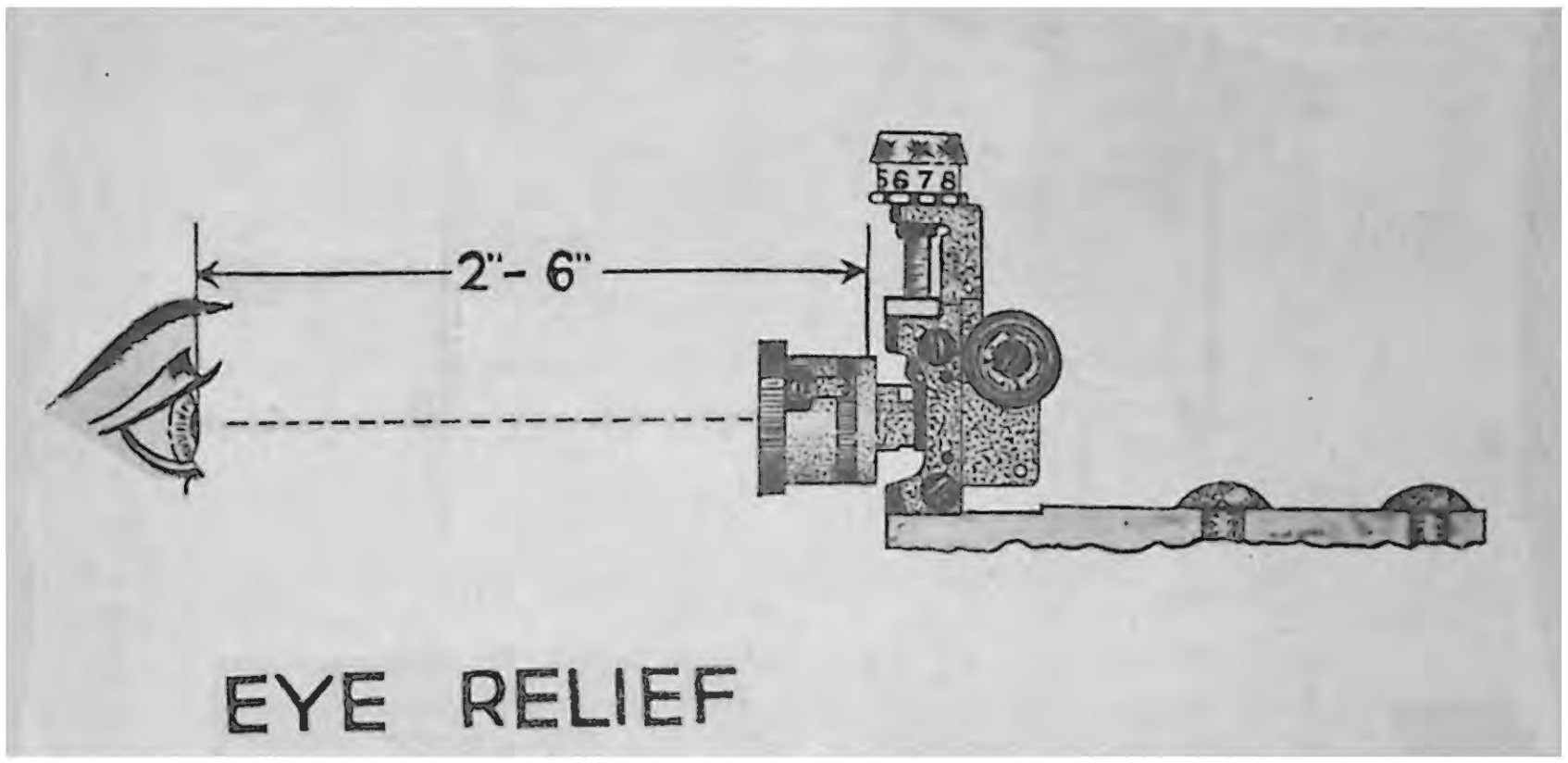


Figure 18.

E. TRIGGER CONTROL: The progressing shooter will at first give a great deal of attention to trigger control. Experienced shooters will also have difficulty from time to time. By making a repeated effort to develop a correct trigger pull, the pull itself will require less and less conscious effort and will eventually assume reflex characteristics.

1. Activating the Trigger:

a. Reflex Action: The awareness of body control will include an awareness of trigger control. However, the shooter can develop his trigger control to the point that activating the trigger requires no conscious effort. He will be aware of the movement, but he will not be consciously directing it. Everyone exhibits this type of reflex activity in daily living. The individual who walks or drives a car while carrying on a conversation is an example. He is aware of his muscular activity, but not "planning" it. He is thinking about the conversation.

b. The same type of reflex circuit can be developed by a shooter. When he initially begins shooting, he must consciously direct his finger to pull the trigger when the rifle settles in the 10-ring. As a result of training however, a so called "circuit" will be established between the eye and the trigger finger. The eye, seeing a sight picture centered on the 10-ring, will then cause the finger to activate the trigger without a conscious mental effort on the part of the shooter. The shooter is aware of the activity of the finger, but is not planning or consciously directing it.

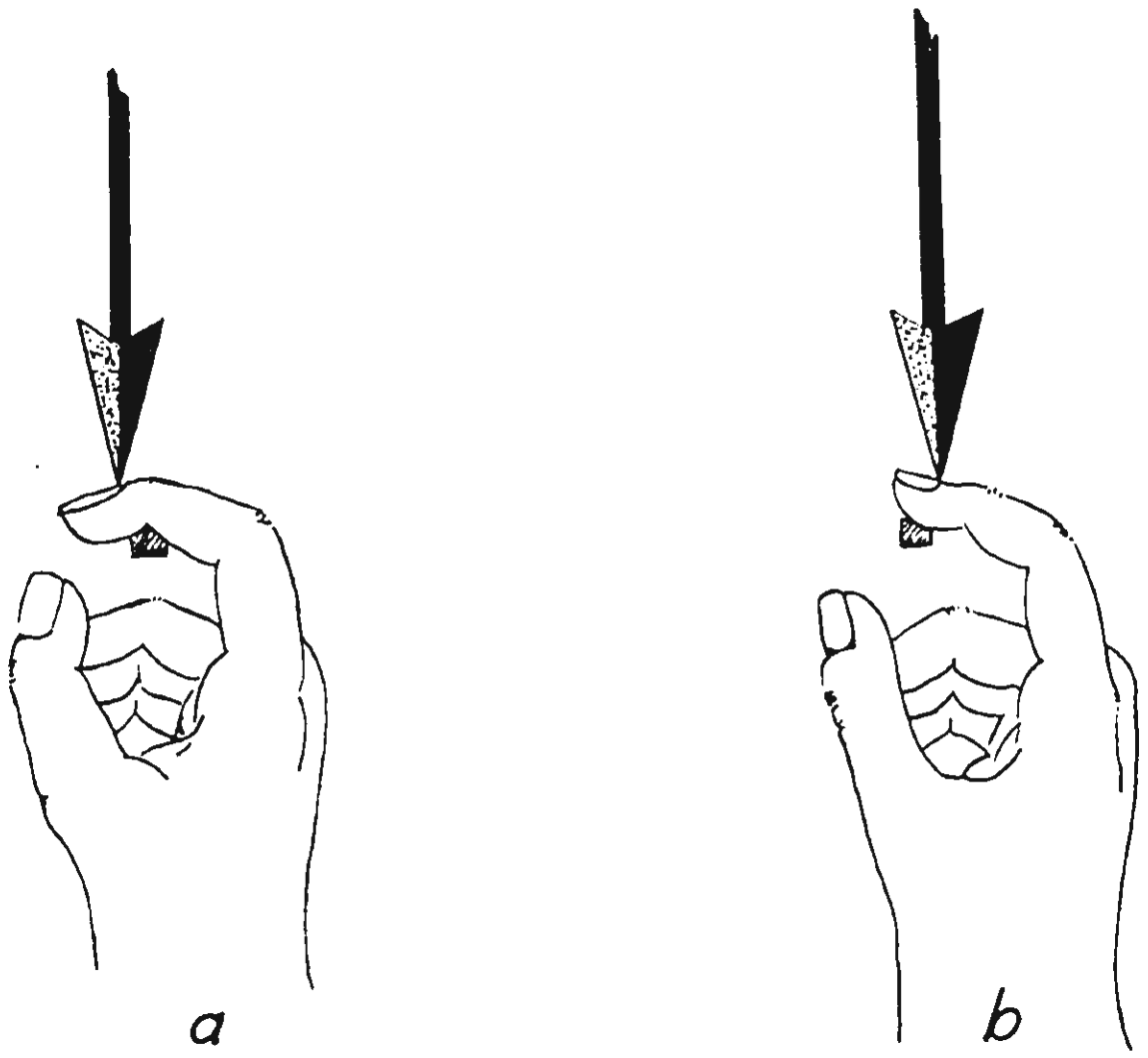
c. Interrupting the Reflex Action: If the shooter suddenly realizes that his rifle is beginning to move out of the 10-ring, he can "break the circuit" and stop the trigger pull. He must then begin the entire shooting cycle over again.

2. Basic Method of Activating the Trigger:

a. When the hold begins to settle, the finger applies pressure to the trigger. As long as the sight picture looks good or continues to improve, the pressure is increased. If the picture deteriorates, pressure is maintained at a constant level or removed completely. Pressure is resumed when the picture starts to improve. There are variations of each of these methods. A beginning shooter should experiment with more than one technique to find the method which best suits his coordination. He should then stay with that method until he has mastered it completely. Some advanced shooters develo a slightly different technique for each position.

3. Finger Placement:

a. When using a trigger that pulls greater than 2 ounces as most beginning shooters use, the finger should be placed on the trigger as in Figure 19. This method permits greater control of relatively heavy triggers.



CORRECT PLACEMENT OF THE INDEX FINGER ON THE TRIGGER

a. PLACEMENT OF INDEX FINGER ON THE TRIGGER FOR A NORMAL SIZE HAND.

b. PLACEMENT OF INDEX FINGER ON THE TRIGGER FOR A SMALL HAND.

Figure 19.

SECTION V

INTERRELATED ASPECTS OF POSITION SHOOTING

There are certain common characteristics of the basic fundamentals that apply to each of the positions.

A. THE SPOTTING TELESCOPE: It should be explained to a new shooter that it is important to place his spotting telescope in a favorable location (Figure 20). This is true of all the shooting positions, but it is most critical when shooting the prone positions. The scope should be placed so that only a slight movement of the head is necessary to bring the eye to the lens. If the shooter must raise or move his body to see through the scope, he may change the established position for his next shot. This shifting can change the natural point of aim or the head position. Unless the change of position is redressed it can move the point of impact. The shooter must insure that he assumes the correct body position first then moves his spotting scope to fit his position, not vice versa.

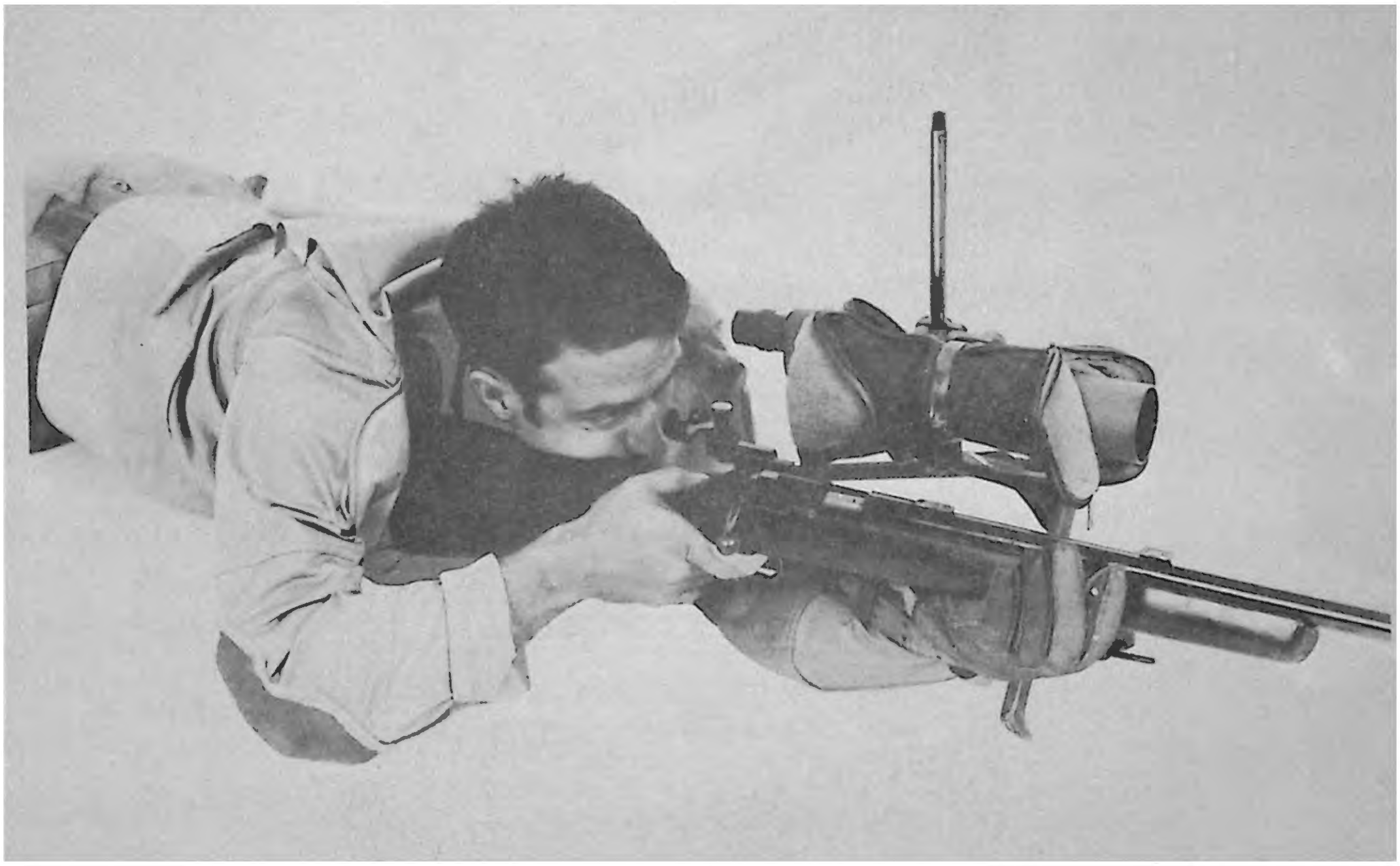


Figure 20. Spotting score placement.

B. THE SLING: The proper use of the sling is a problem that constantly confronts the shooter. As recommended in the chapter on equipment, a sling should be made of leather. The sling is used to support the weight of the rifle. The left arms muscles alone should not be used to support the rifle in any position.

1. The sling is fastened to the rifle at the under side of the stock. The sling should pass flatly over the back of the wrist. Most shooters soon learn not to wear a wrist watch underneath the sling.

2. The sling is fastened to the upper left arm at one of two places; above the tricep or below the tricep (Figure 21). These locations are the best because they will conduct the minimum pulse beat. The sling is tight on the rear of the arm, yet does not form a tourniquet about the arms as that will restrict blood flow and result in a greater pulse beat. The sling provides a space along the front of the arm to allow for proper circulation of the blood (Figure 22).

3. If the sling is too loose, it will slide down the arm and lose its support value. The shooter should insure that the sling does not slip in this manner.

4. The final decision as to length of the sling and placement on the arm is made by the individual when he determines where he gets the best support, steadiness, and comfort.

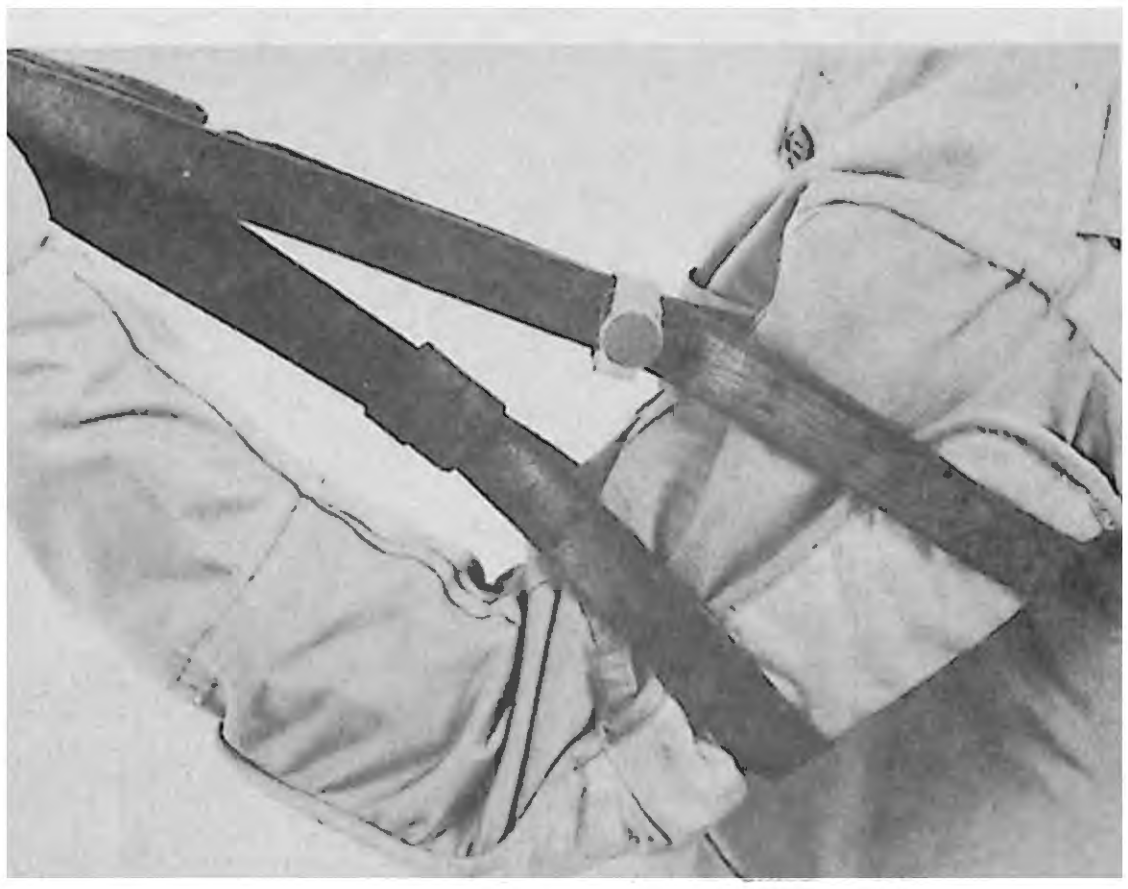


Figure 21. Sling adjustment and position.

Figure 22. Sling adjustment and position.

C. REQUIREMENTS OF A POSITION: There are certain satisfactory results that we want from any shooting position that we build. First we decide what we want and then we work on how to achieve the goal.

1. The most important requirements of a position is that it must provide a good hold (very little movement). We will define hold as the area of movement during the period which a shooter contemplates firing the shot. The shooter that most frequently holds in the 10-ring will be the one that most frequently hits the 10-ring. The center of gravity of the rifle-body structure must be located so that maximum use will be derived from all available support areas.

The shooter has two methods of appraising his hold. One of these methods is the movement (or lack of movement) he sees in his sight picture. The other is the movement (or lack of movement) he feels in his muscle systems. As closely related as they are, these two methods become clearly separated in the mind of a trained shooter.

2. The second consideration is the amount of shooter comfort that is established. A shooter that is experiencing pain from an assumed position will not be able to concentrate his full effort on such important matters as delivering the shot.

3. The third consideration is to insure that the body is functioning properly. Make sure that blood is flowing to all parts of the body. Check to insure that breathing is not restricted because of constriction in the chest and/or stomach. The shooter must find a position that allows for efficient body function while he is firing.

4. The position must be legal as stipulated in NRA rules.

E. BUILDING THE POSITION:

1. When building a position, one must utilize the available support areas to the maximum. A prone position is more stable than a standing position because there is a much larger support area. In positions where only a minimum of support area is available, the shooter must learn to locate the center of gravity of the body-rifle structure so that proper balance is maintained and the best hold is induced.

2. The position that delivers the best hold is based upon bone support. Bone structure supports the weight of the rifle. Because the muscles are relieved of this weight, they are less likely to fatigue and develop tremors. The shooter maintains better muscle control, and his area of wobble remains at a minimum throughout the course of fire.

F. MUSCLE TENSION:

1. To aid in holding the body still, the shooter should maintain a slight degree of tension in all body muscles. This tension provides for finer graduations of muscle control.

2. It must be emphasized that the tension is very slight. Completely tensed or "locked" muscles quickly fatigue and begin to tremble slightly. The correct tension is very near to complete relaxation. Portrayed on a graph, the amount of tension used in shooting would appear as in Figure 23. This tension is so slight that it is hardly felt by the shooter.

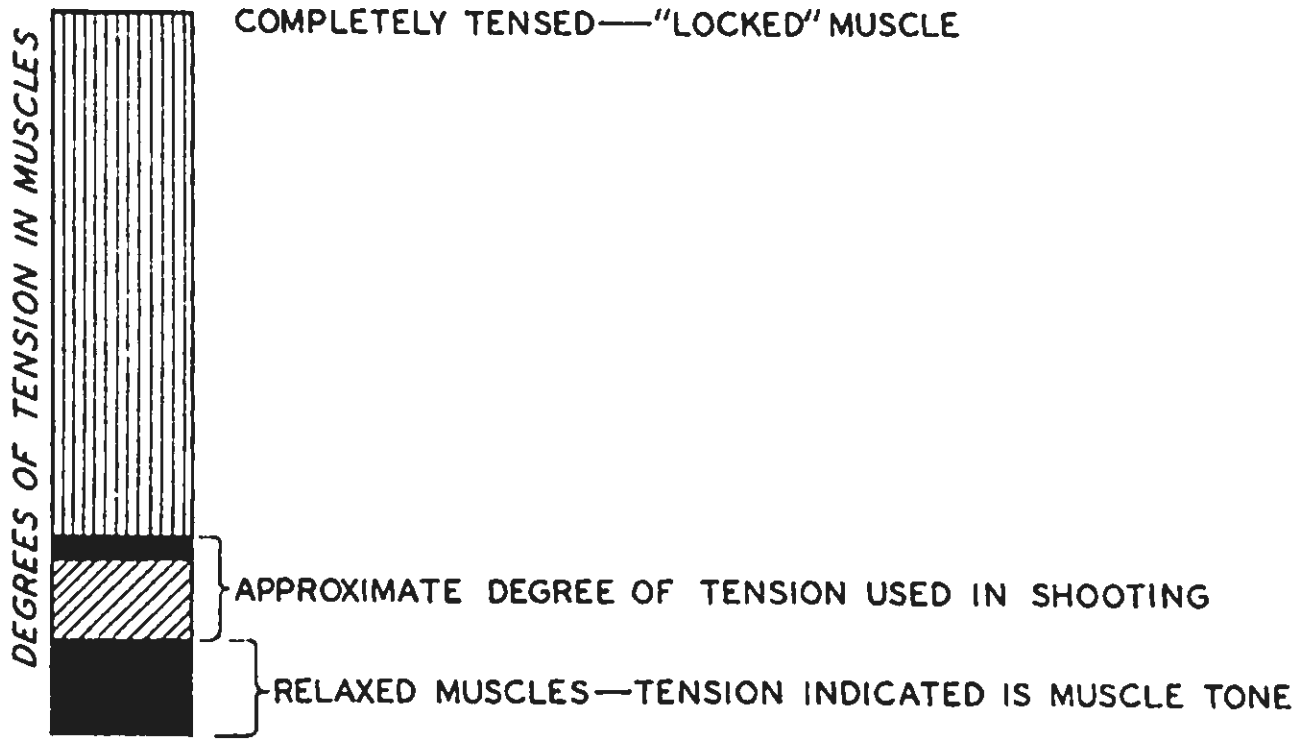


Figure 23. Muscle tension.

G. ERECT HEAD POSITION: Why does a shooter tip his head to the right while firing? The obvious answer is: He must place his face against the stock to see properly through the sights. The solution to his problem (and tilting his head does cause problems) is to retain the head in the normal erect position and bring the rifle to his face.

1. This necessary condition is accomplished by placing the butt plate high on the shoulder. The top of the stock is raised above the shoulder and neck to a level where the eye and rear sight are on the same plane. The firer now is able to keep his head erect but it may not solve the matter of looking straight through the sights.

2. Canting the rifle is one method by which the shooter is able to achieve the proper sight alignment while retaining proper head position. This is true in any shooting position. The degree of cant is very critical. The amount of cant must be the same for each shot or the strike of the bullet will deviate greatly. The shooter should keep in mind that in adjusting sights to compensate for cant, a sight change in windage will also result in change in elevation and vice versa.

3. Cant can be measured by mounting a level bubble on the rifle. A shooter will then be able to observe his cant angle. After numerous hours of practice, almost instinctively the shooter will develop a uniform cant and the level bubble may not be necessary.

4. It must be emphasized that shooting with a cant still is not being taught as the proper procedure. If correct position will permit, the rifle should be held with sights perfectly vertical. Cant is merely an alternative for those shooters seeking a solution to a problem. If a problem does not exist, do not introduce one.

5. The position of the sight should result in the shooter assuming a natural upright head position. The sight should be adjusted to the head position, and not the head position to the sight. The importance of head position will be discussed again in later sections.

H. EYE RELIEF:

1. The eye relief, or distance from the eye to rear aperture, should be approximately 2-6 inches, depending on the position (Figure 18 - see Section IV, The Integrated Act of Firing - The Eye and Sight System). How many rifle enthusiasts shoot the standing position with their head thrust forward in exaggerated manner that results in their eyebrow resting right up against the rear sight? TOO MANY?

2. Placing the sight against any part of the face or the shooting glasses will very possibly result in wear to the delicate sight assembly, or injury to the shooter from recoil (especially with a large caliber rifle). When the rifle is fired, a shooter can unconsciously develop a flinch as the sights repeatedly hit against the eye area. This can definitely produce a poor shooting position.

I. RECOIL AND THE ANGLE OF JUMP:

1. Every shooter becomes familiar with the recoil of a rifle. Recoil occurs because expanding powder gases propel the bullet and the cartridge case in opposite directions. The bullet travels forward through the bore. The force applied to the base of the cartridge case is transmitted to the rear against the bolt.

3. In all positions, a change in the position of the butt plate against the shoulder or change in amount of cheek pressure on the stock can cause a major change in zero, due to the amount and direction (angle) of jump.

4. The shooter should attempt to hold the rifle in exactly the same way each time he fires during a string.

J. FOLLOW THROUGH:

1. Follow through is the act of maintaining hold and concentration until a shooter can no longer affect the flight of the bullet. Two methods of checking follow through are dry firing and having a coach load the shooter's rifle by using dummy rounds periodically and checking the shooter's reaction as he fires the shot. By calling the shot the shooter anticipates the placement of his shot using the angle of jump, the appearance of his sight picture, and if outdoors any changes in the wind which may have occurred before the shot was fired. It is imperative that the shooter call the shot before looking through the scope, otherwise a false call may result.

2. The act of calling a shot is a very important aspect of shooting. By calling the shot the shooter can evaluate his zero, his ammunition, the value of the wind, and his performance. After learning to call shots, a shooter who observes a shot off call will not hesitate to find out why and make an adjustment. Usually an adjustment in the sights is necessary either by firing sighter shots or changing the sights from experience.

SECTION VI

THE POSITIONS

A. GENERAL:

The beginning shooter must realize that the positions will not feel comfortable until he has practiced each one many times. Through practice and application of shooting techniques learned from Sections III and IV the body will become accustomed to the positions and scores will improve. The following are step by step descriptions which tell how to get into each position correctly.

B. THE PRONE POSITION:

1. The shooter lies to the left of the line of fire with his body forming a 5 to 15 degree angle from the line of fire. (Figure 24).

2. The body is not twisted, but is stretched out and relaxes; the spine is straight.

3. The left leg is nearly parallel to the spine, with the toes pointed inward.

4. The right leg is angled away from the spine at approximately 45 degrees and the knee is bent so the lower leg is almost parallel to the left leg. The toes are pointed outward.

5. The left elbow should be slightly to the left of the rifle. (Figure 25).

6. Relax the left arm, hand and fingers.

7. The sling may be high or low on the arm and adjusted so that it supports the weight of the rifle. No effort should be made to hold up the rifle with the left hand and forearm. The left hand is pushed forward against the handstop.

8. The right elbow is placed a comfortable distance away from the body and support very little weight.

9. The right hand grips the stock with a comfortable amount of pressure.

10. Fit the butt plate snugly into the shoulder and locate it in the same place for each shot.

11. If the shooter is not lined up directly on target rotate the entire body and/or adjust the length of the sling.

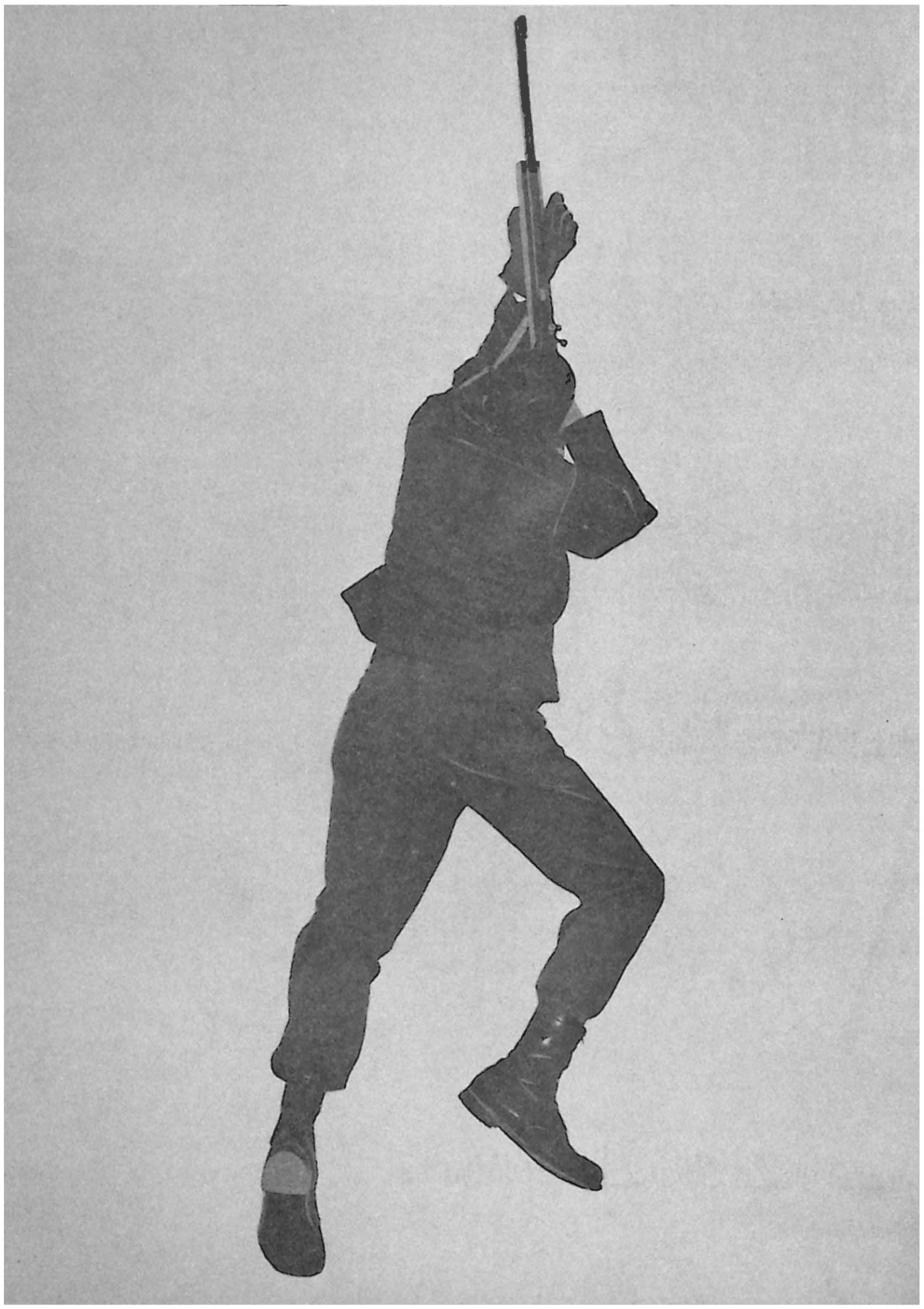


Figure 24. Prone Position - Vertical.

Figure 25. Prone Position - Front.

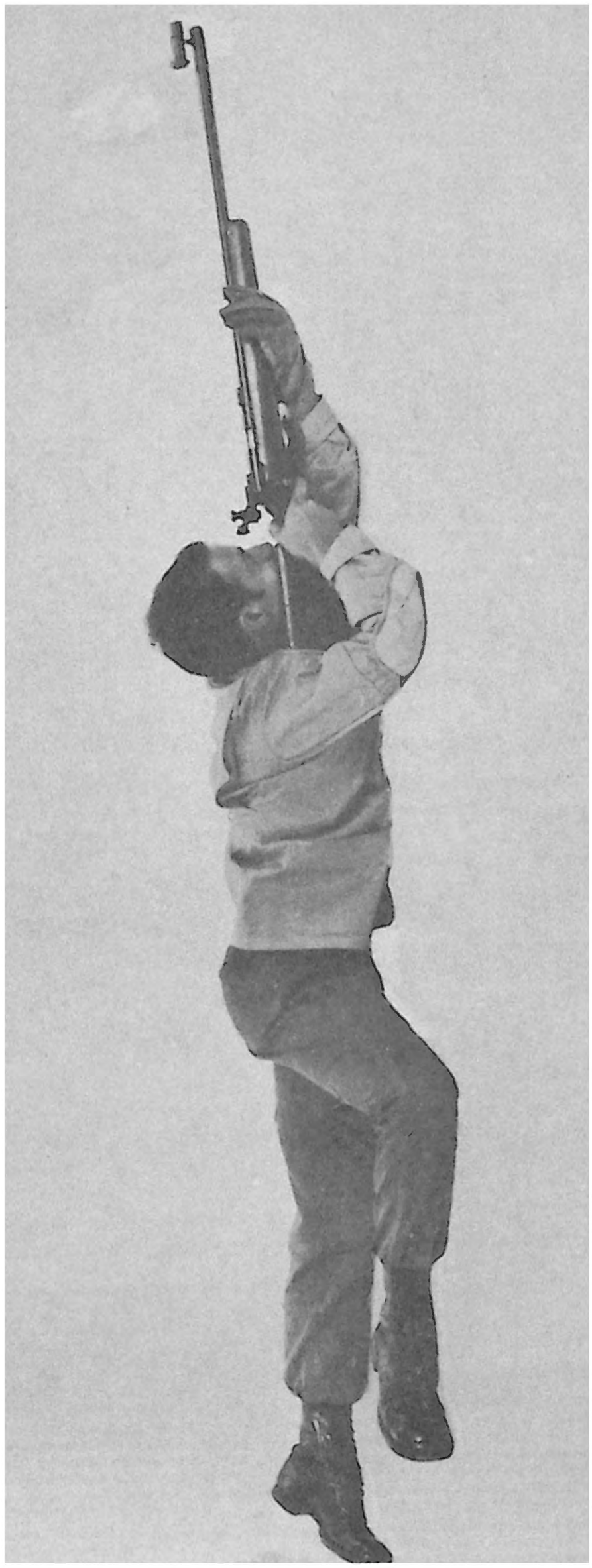


Figure 26. Prone Position - Side.

C. THE SITTING POSITION:

1. The shooter sits about 30 degrees to the right of the target.

(a) Sit with legs crossed left in front of right (Figure 27).

(b) Sit with ankles crossed left in front of right (Figure 28).

2. The body is bent forward.

3. Elbows rest on or near the knees.

4. The sling should be placed high on the arm and should be fairly short.

5. The handstop should be pulled back and the left hand pushed forward against it.

6. The rifle should be kept as high as possible to avoid tilting the head excessively.

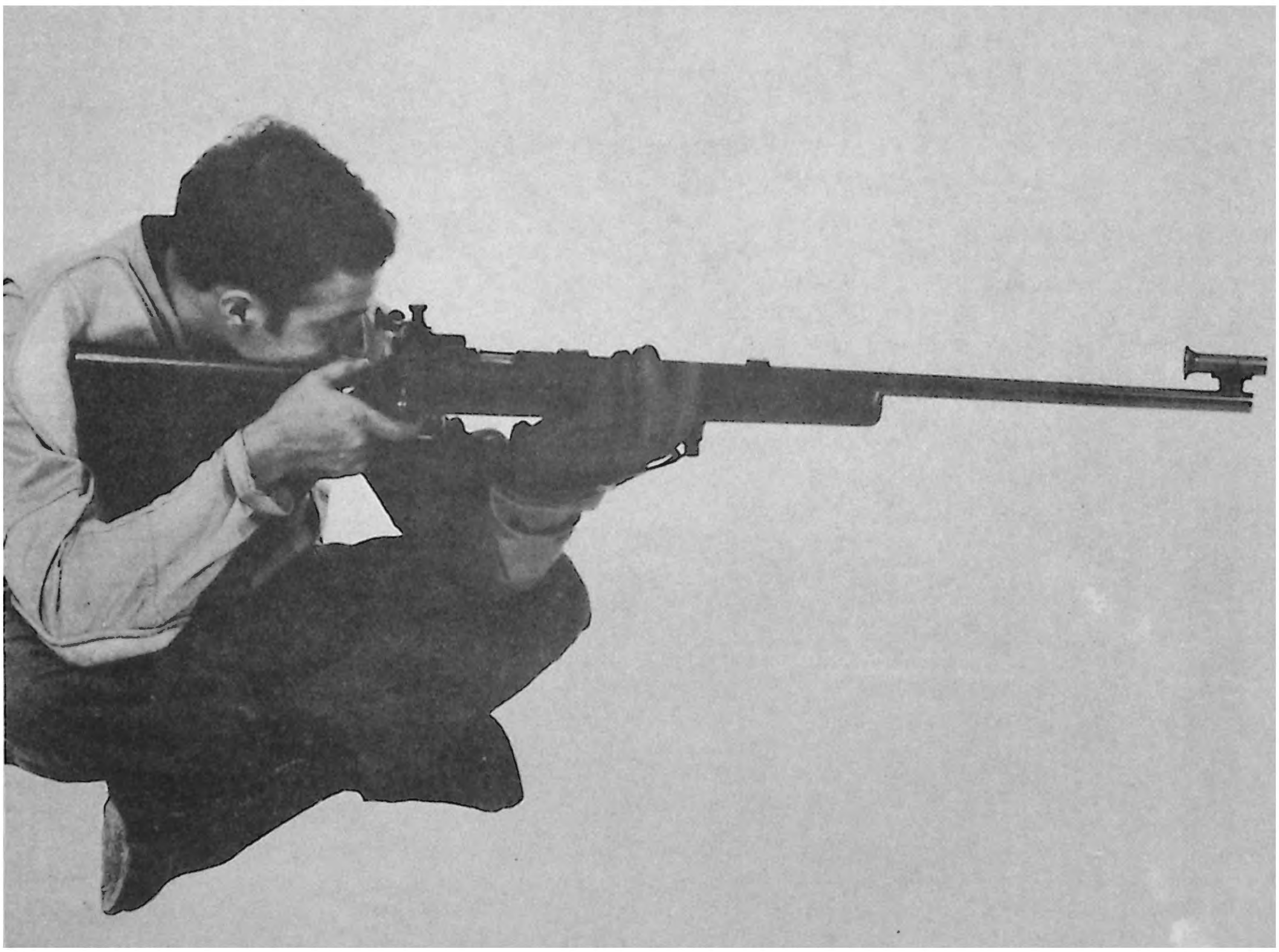


Figure 27. Sitting Position - Crossed Legs.

Figure 28. Sitting Positions - Crossed Ankles.

D. THE KNEELING POSITION:

1. As in sitting face about 30 degrees from a line of fire to the target.

2. The right thigh is about a 20-60 degree angle from the target.

3. Most of the body weight rests on the right foot and kneeling roll. (Figures 33, 34, 35).

4. The left foot is approximately parallel to the right thigh. (Figure 36).

5. The left shin bone is in a vertical position from the ground. (Figure 29).

6. The left elbow is placed on top of the left knee and the fingers of the left hand don't grasp the rifle. (Figure 29).

7. The left foot, knee and elbow are slightly to the left of the rifle. (Figure 31).

8. As a guide, the left forearm and left thigh should form a straight line when supporting the rifle. (Figure 29).

9. The right arm hangs naturally to the side and the right hand grips the stock firmly. (Figure 30).

10. The butt plate is placed high in the shoulder and the head is erect.

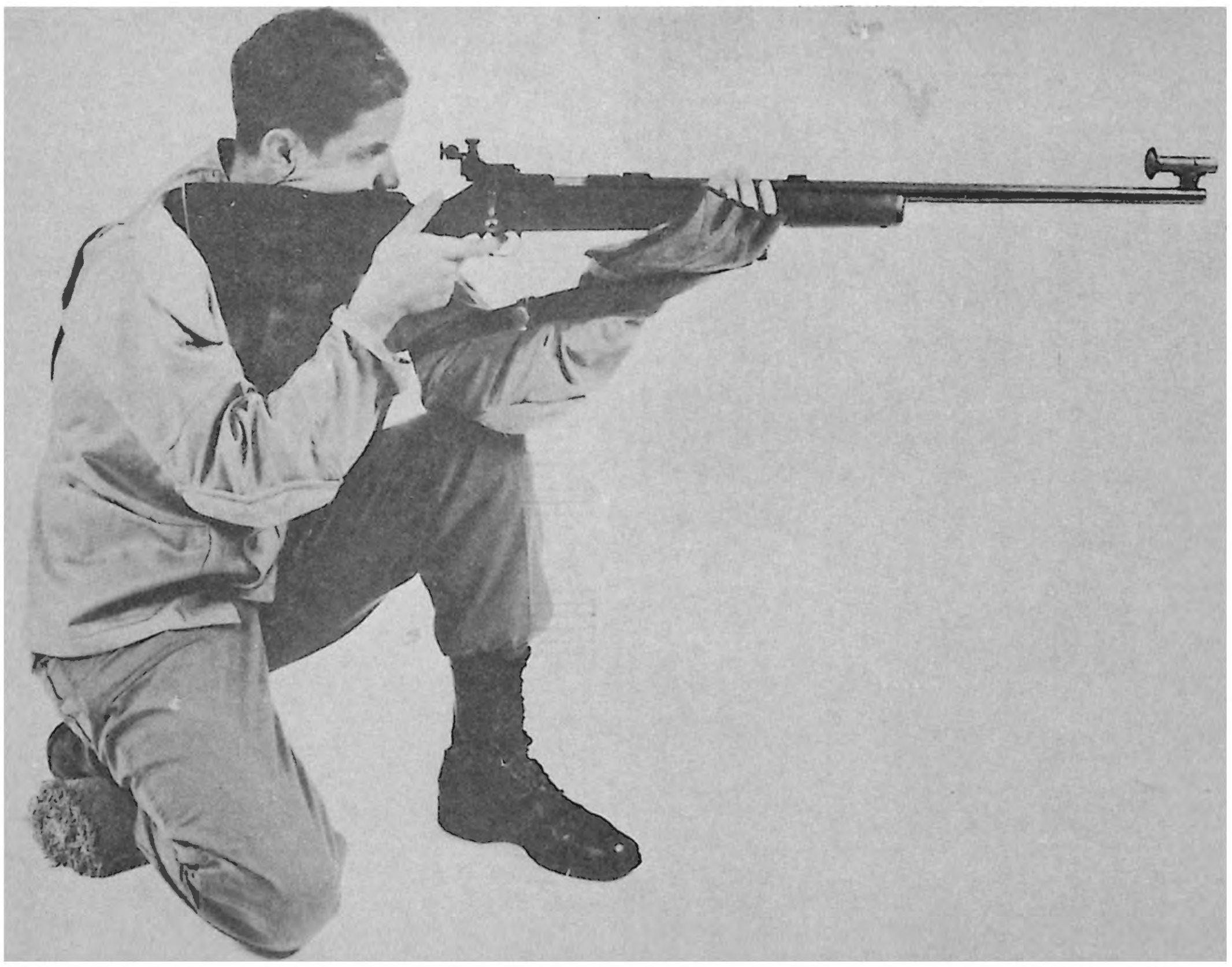


Figure 29. Kneeling Position - Right Side.

Figure 30. Kneeling Position - Front.

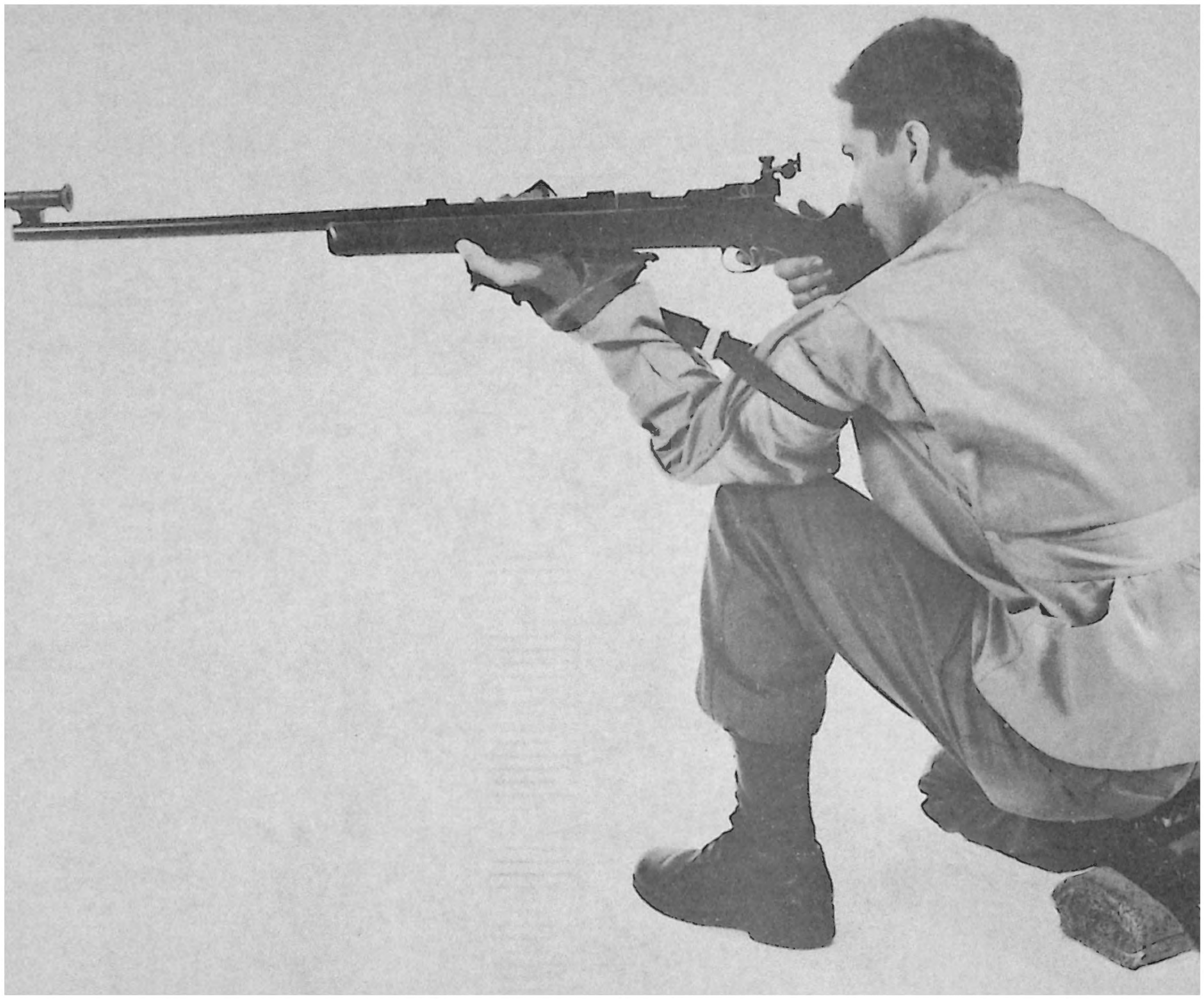


Figure 31. Kneeling Position - Left Side.

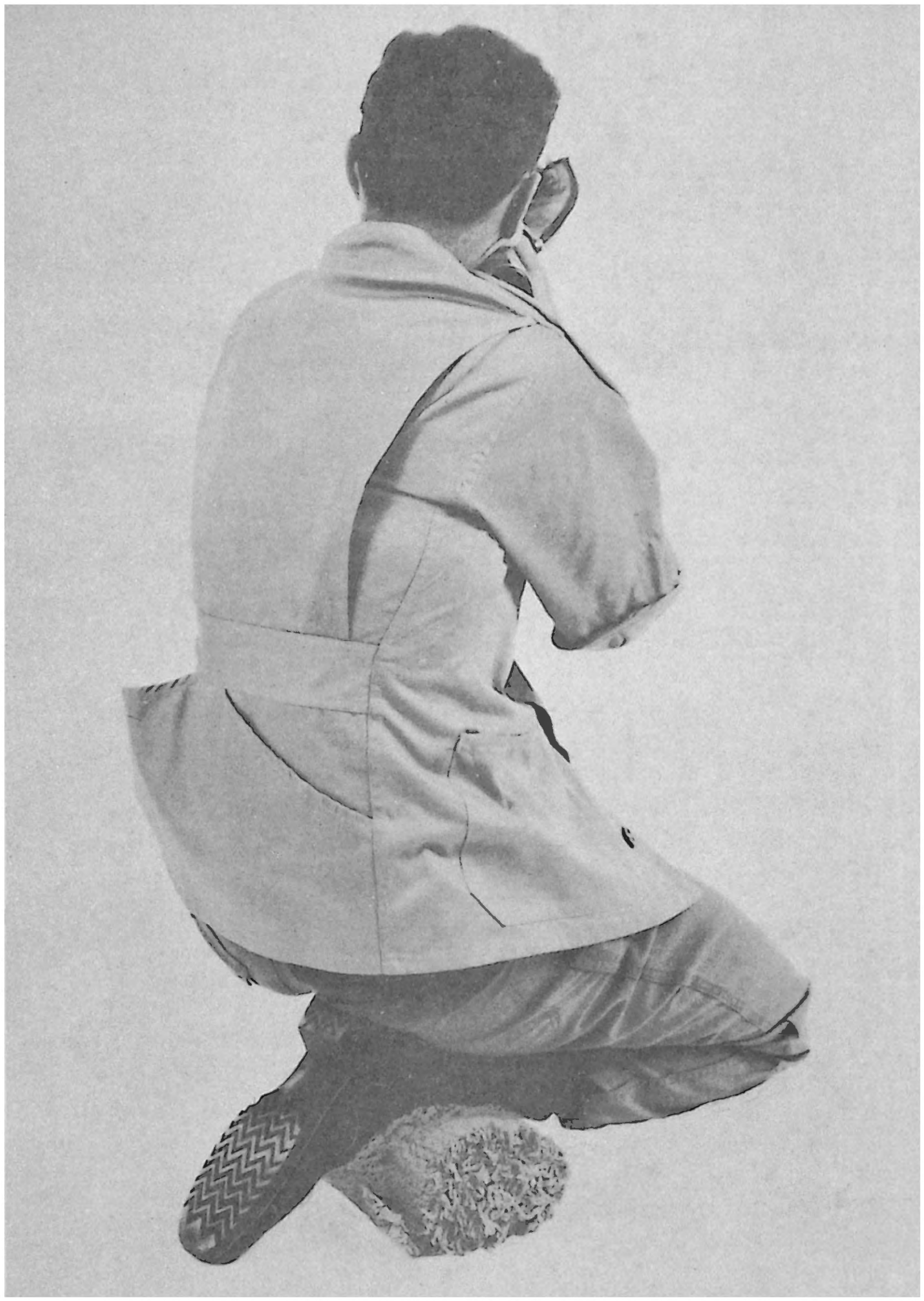


Figure 32. Kneeling Position - Rear.

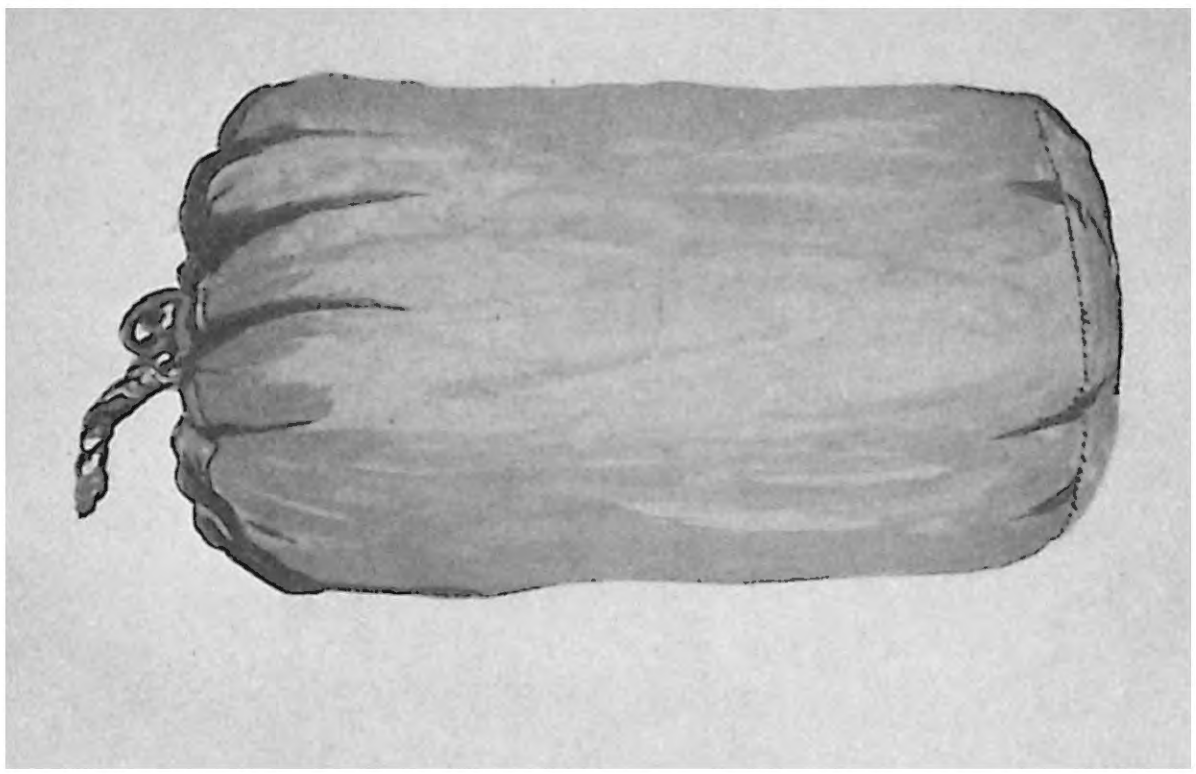


Figure 33. Kneeling Roll.

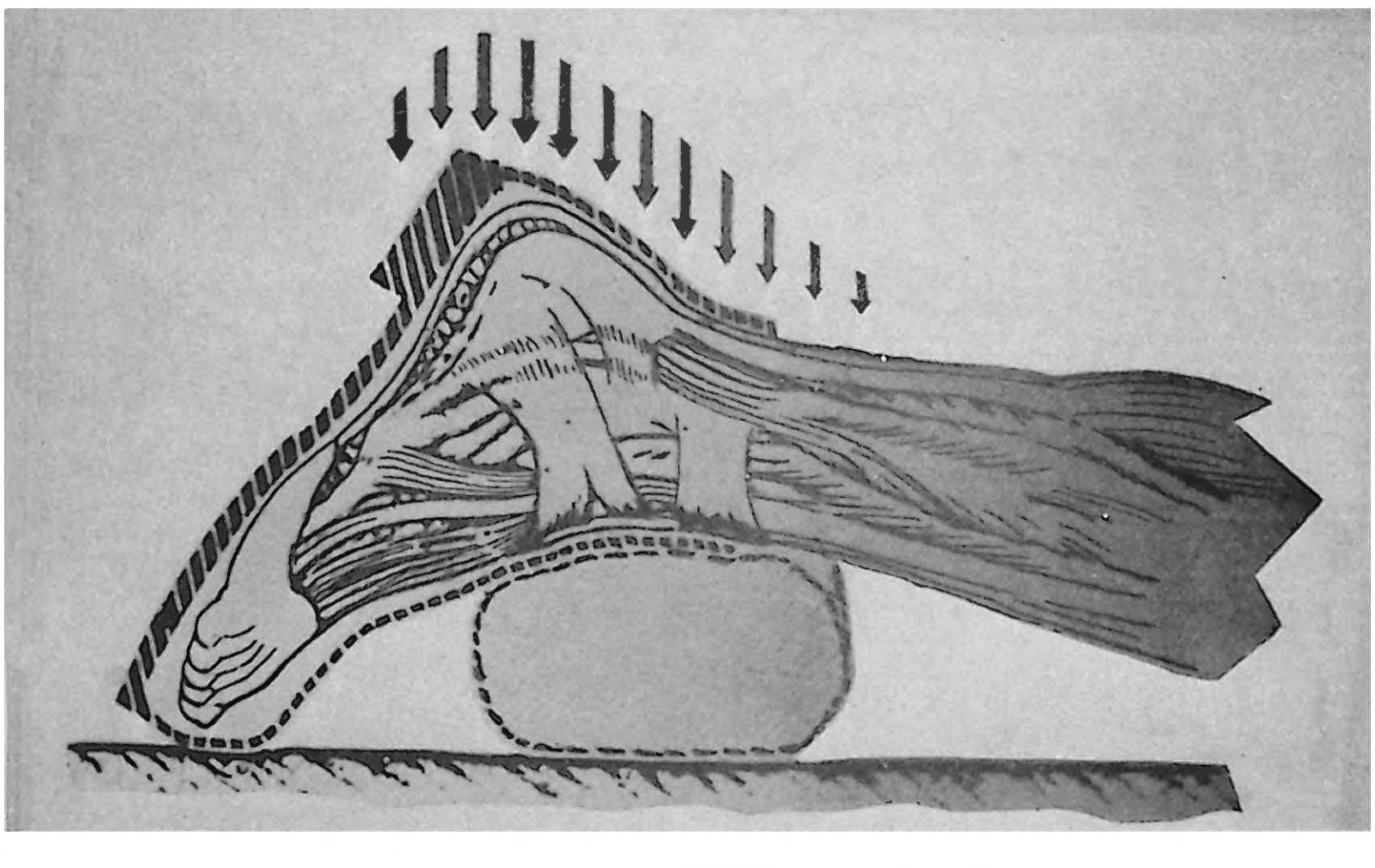


Figure 34. Ankle Position on Roll.

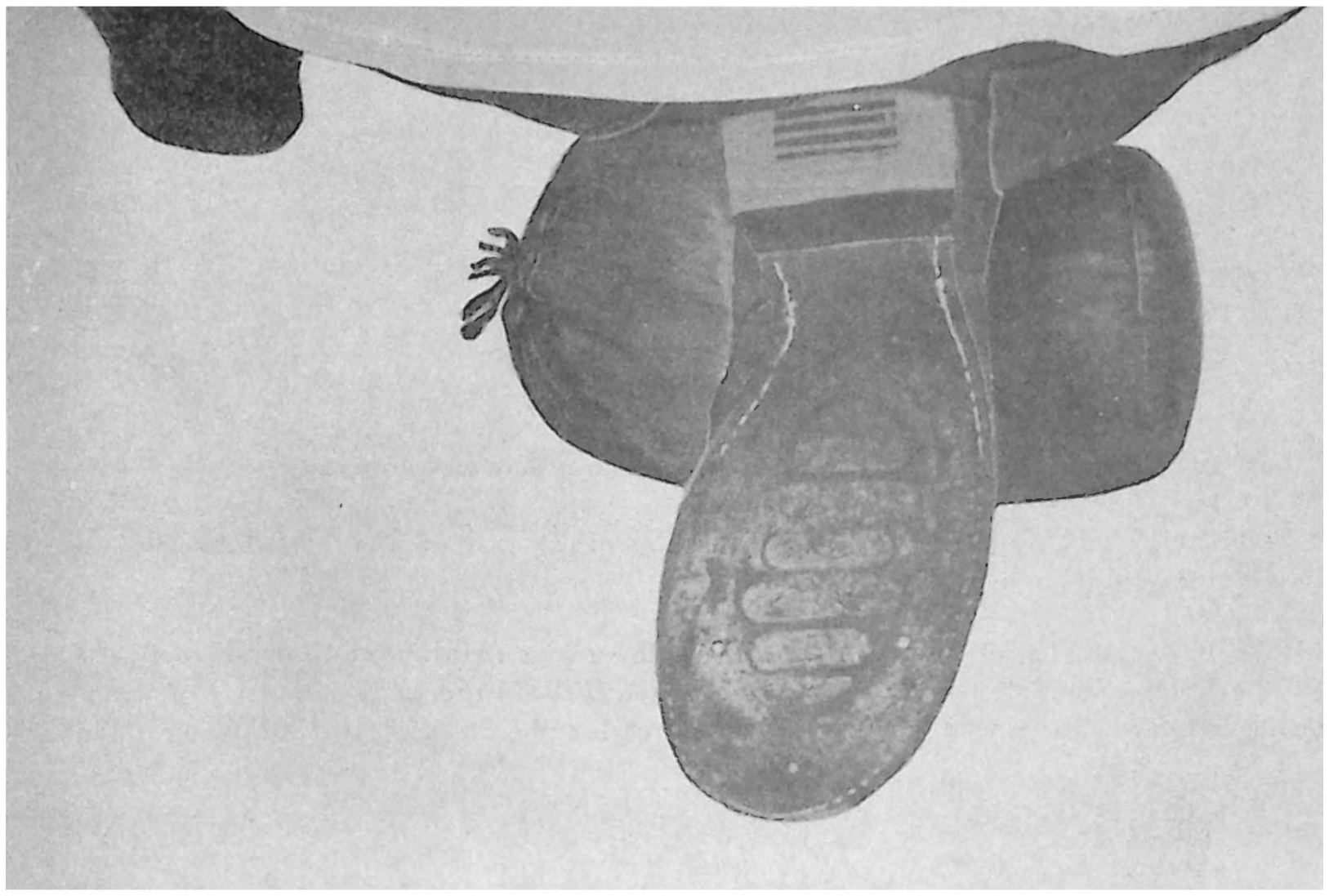


Figure 35. Kneeling Position - Heel Placement.

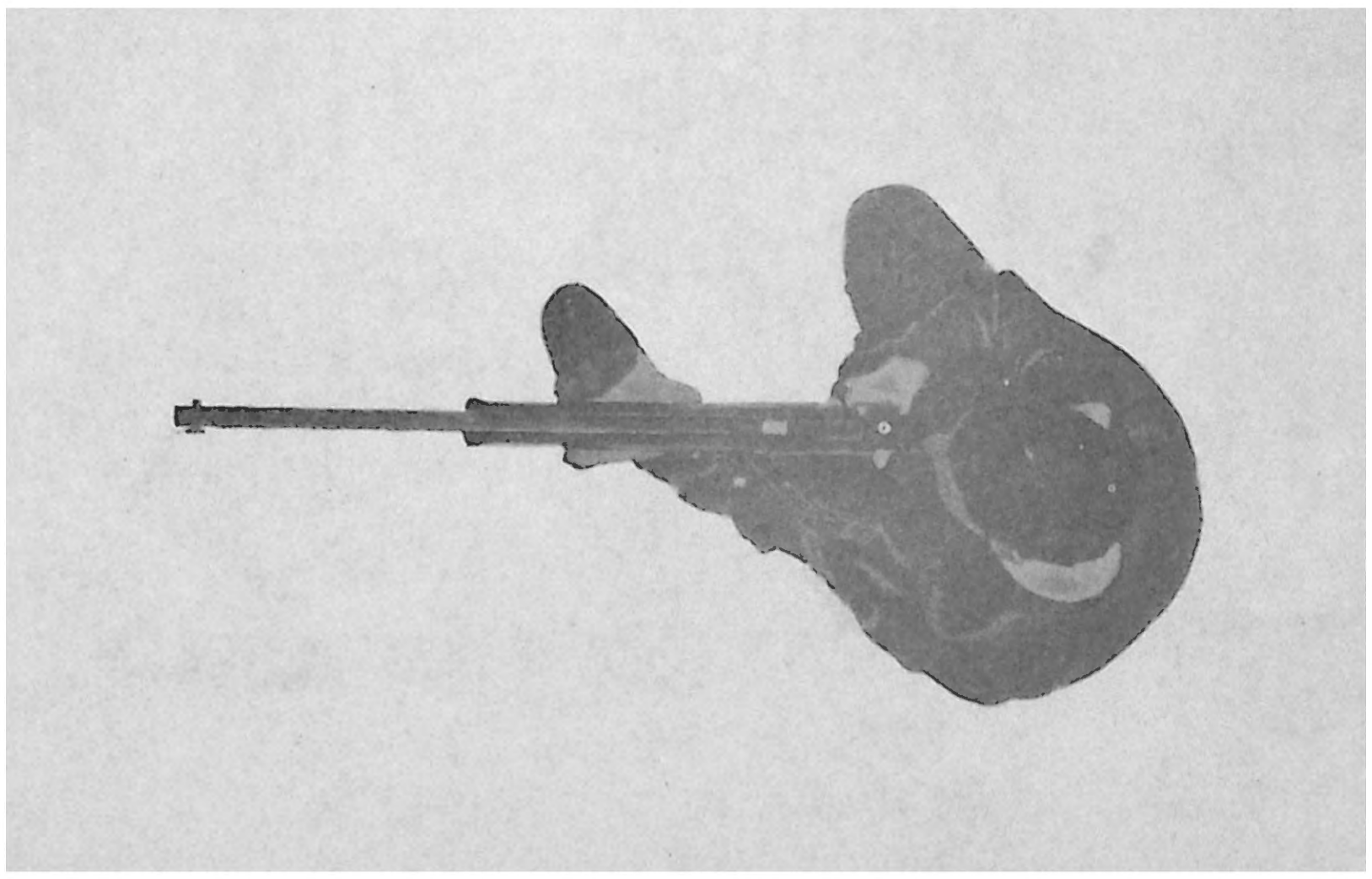


Figure 36. Kneeling Position - Vertical.

IE STANDING POSITION:

The feet are parallel to the firing line and shoulder width apart. Toes may be turned slightly d. (Figure 37).

Knees are straight, not locked back.

Place rifle to the shoulder and bend backwards and twist the torso so shoulders are about 60-70 s from a line of fire to the target.

The left upper arm rests against the rib cage. No attempt should be made to rest on the hip (Figure 37 and 38).

The left hand supports the rifle at its balance point. (Figures 37, 38, 40, 43). Rifle should not fingertips.

Place the butt of the rifle high in the shoulder and keep the head upright.

The right hand grips the pistol grip firmly and the right arm is raised somewhat and pulls back the rifle in place.

Back bend and body twist mentioned in step 3 is the most important feature of the standing position. The body-rifle structure reaches a state of balance with a center of gravity directly above a point between the feet. Bone support is utilized and muscle tension is reduced.

Figure 37. Standing Position - High Stock, Maximum Eye Relief.

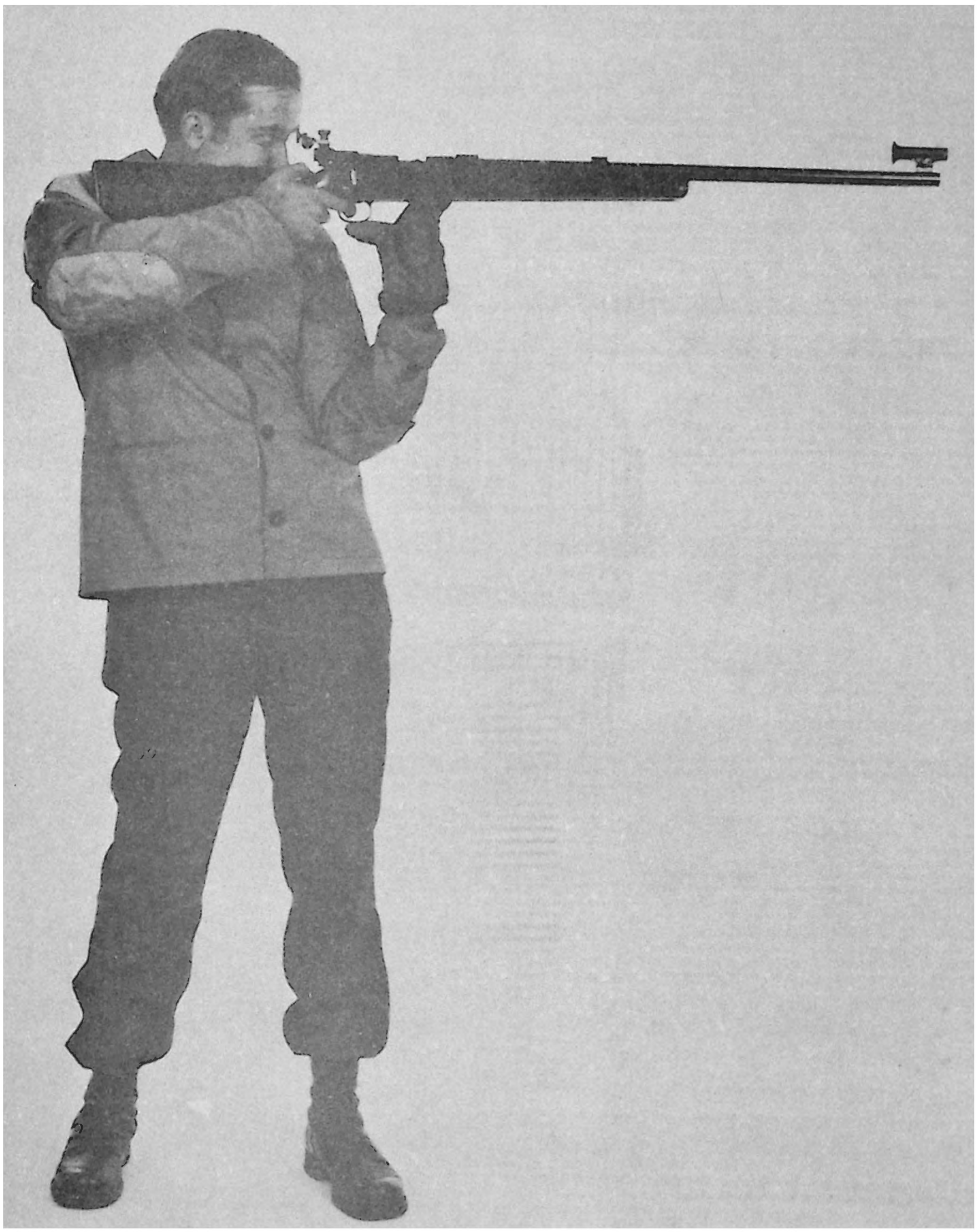


Figure 38. Standing Position - Low Stock, Minimum Eye Relief.

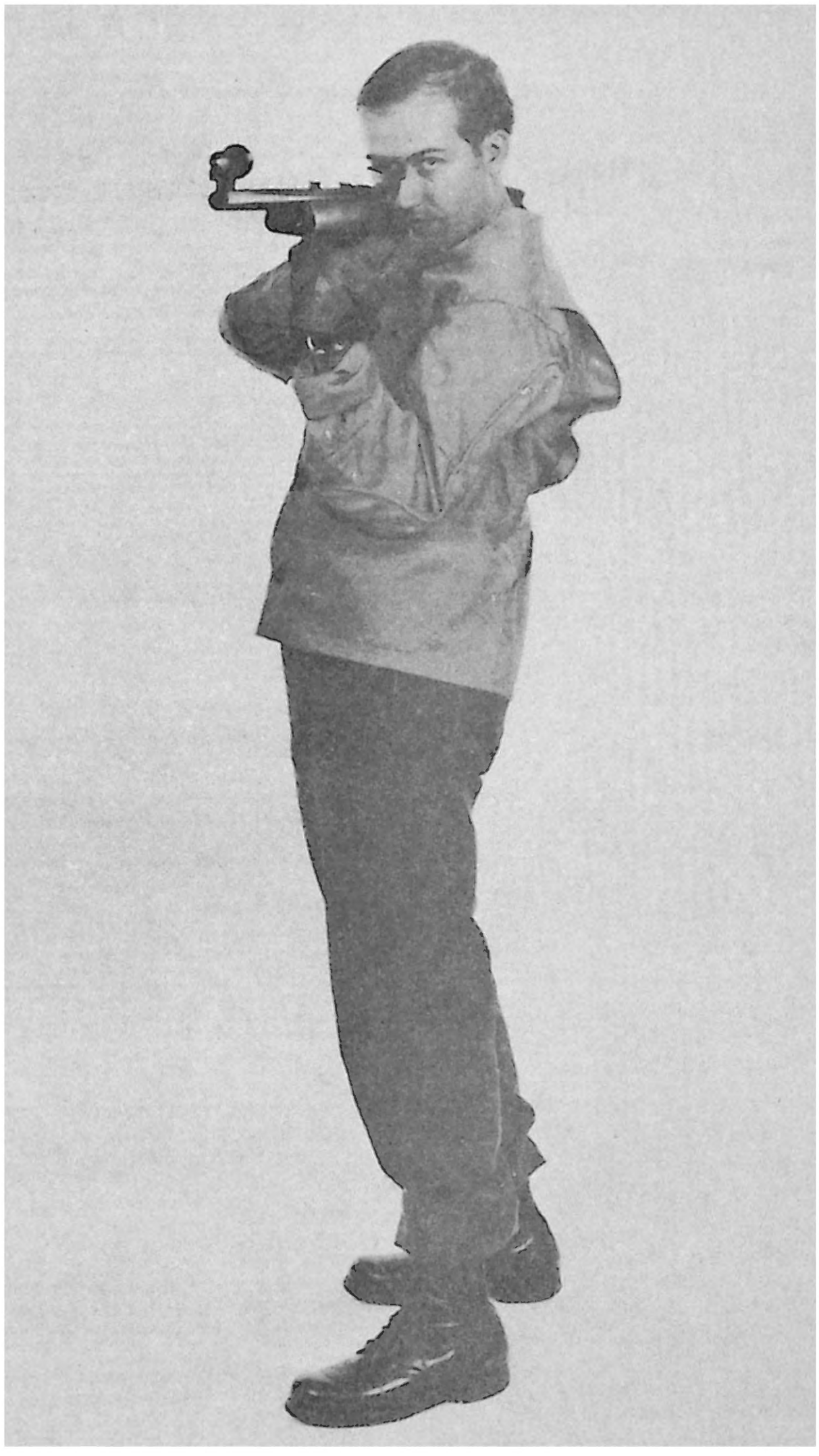


Figure 39. Standing Position - Front.

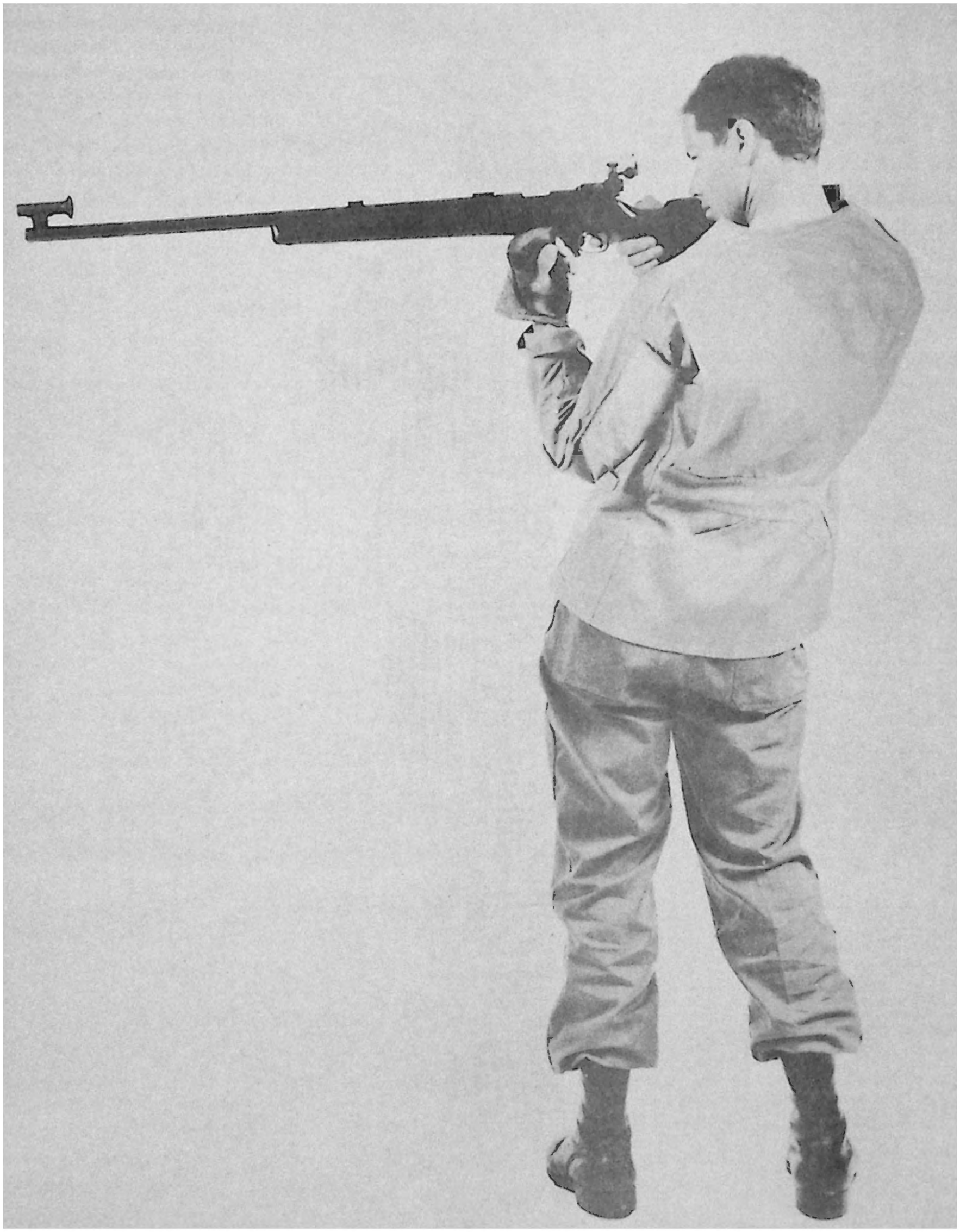


Figure 40. Standing Position - Side.

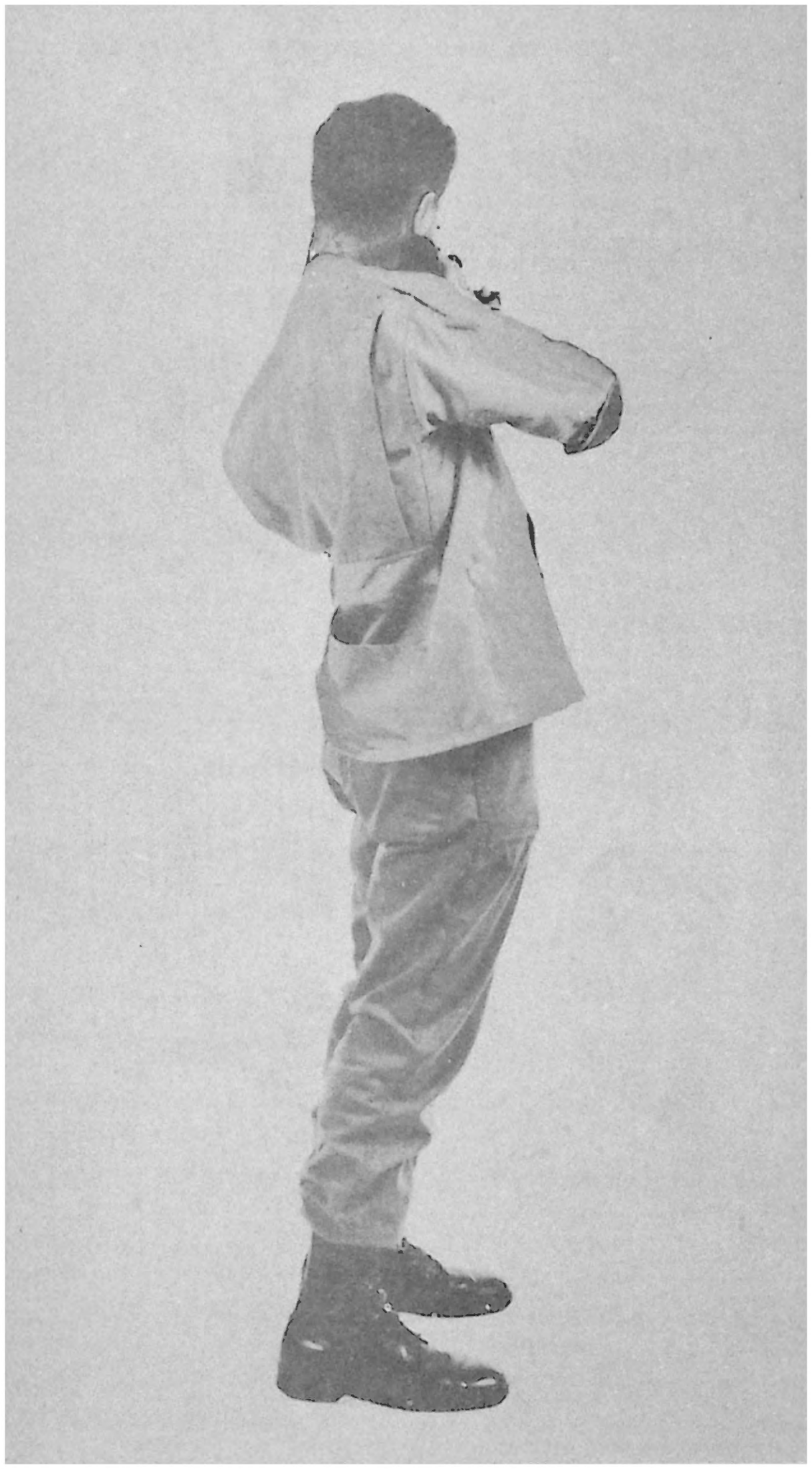


Figure 41. Standing Position - Rear.

Figure 42. Standing Position - Incorrect Supporting Arm Position.

Figure 43. Standing Position Correct Supporting Arm Position.

SECTION VII

SHOOTING HABITS

A. GENERAL: In the process of devoting a great deal of time to marksmanship, a competitor will, through his own experience, find that there are a number of helpful hints which he can pass on to newer shooters. Some of the items contained in this section are in the form of shooting safety while others may pertain to such varied areas as etiquette and shooting procedures.

B. SAFETY:

1. Before any individual is exposed to the use of firearms he should receive a period of instruction on safe handling of weapons. This instruction should include knowledge of range commands and range procedures.

2. Do not attempt to work on any piece of shooting equipment unless you are highly qualified. This is especially true of tampering with the intricate mechanical components of such items as triggers or telescopes.

3. Do not attempt to hand load ammunition unless qualified to perform the operations safely.

4. Learn how to properly care for all of your equipment. Most of it is expensive and preventive maintenance is important. This includes the cleaning of the bore after shooting.

5. Never touch another competitor's rifle or equipment without his permission.

C. PROCEDURE:

1. Read and know the rule book for the type of shooting you are to participate in and keep abreast of recent changes.

2. Prepare for oncoming matches. Get a copy of the program and read it carefully! Send in entries early. Make arrangements for living accommodations at out of town matches. Make a list of all items of equipment and check the list before you depart from home. Inspect your shooting gear.

3. If you have never been to the range before, always go to the range the day before the match. Some ranges are extremely difficult to find and many shooters have missed their relay because they became lost on the way to the range.

4. Arrive at the range early enough to greet all your friends and set up your equipment behind your designated firing point.

5. Test and select your ammunition before you go to a match. Keep the ammunition in a cool and dry place, not for example, in a hot car trunk.

6. Police your brass and clean up trash around your firing point before leaving the range.

7. Insure that your target is the correct one for the match being fired, and that you have entered the appropriate information on it.

8. Double check your target and backing target to be certain they are securely fastened to the frame and will not blow loose.

9. Place the backing target in the correct location and be certain that it is correctly marked.

10. You will normally not be permitted to handle your own target after you have fired on it.

11. Know what to do in case of a crossfire or shot outside the scoring ring of the sighting bull's eye.

12. Before shooting for record, fire about five fouling shots through your barrel, and then at least five sighting shots. This gives you and your gun a chance to "settle down".

13. Load the round into the chamber with your fingers. Pushing it in with the bolt can result in lead being stripped from the bullet.

14. Keep accurate count of the number of rounds you have fired at each bull.

15. Don't worry about looking at other competitor's targets until you have finished firing your own.

16. Keep an accurate account of the time in a match.

ANNEX 1

PROGRAM OF INSTRUCTION (PŌI)

Four or five 45 minute blocks of instruction with each being followed by a 30 minute practical application.

BLOCK 1 - Introduction

Safety
Equipment
Sighting and Alming (includes eye relief, sight picture)
Practical Application - Triangulation Exercise and become familiar with range and equipment.

BLOCK 2 - Review last block of instruction briefly.

Breath control
Trigger control
Prone position
Practical Application - Shoot and/or Dry Fire in Prone

BLOCK 3 - Review last block of instruction briefly.

Building the Position (bone support & balance)
Muscle Tension
Sitting Position
Practical Application - Shoot and/or Dry Fire Sitting

BLOCK 4 - Review last block.

Physical & Mental Conditioning (includes shooting habits).
Kneeling Position
Practical Application - Shoot and/or Dry Fire Kneeling

BLOCK 5 - Review last block

Standing Position
Conclusion
Practical Application - Shoot and/or Dry Fire Standing

Fire 4 position match after some period of time of practice.

ANNEX 2

INSTRUCTIONAL MATERIALS

GENERAL: The most important training materials, of course, will be the rifle, shooting equipment and a safe shooting range. The following is a list of materials helpful to use but not absolutely necessary, available through the U.S. Army channels, the National Rifle Association and/or "home-made" items.

A. Chalk Board and Chalk.

B. Posters and charts depicting correct sight picture and alignment, respiratory cycle, trigger finger placement, list of safety rules, etc.

C. Triangulation sighting exercise equipment (illustrated and described below).

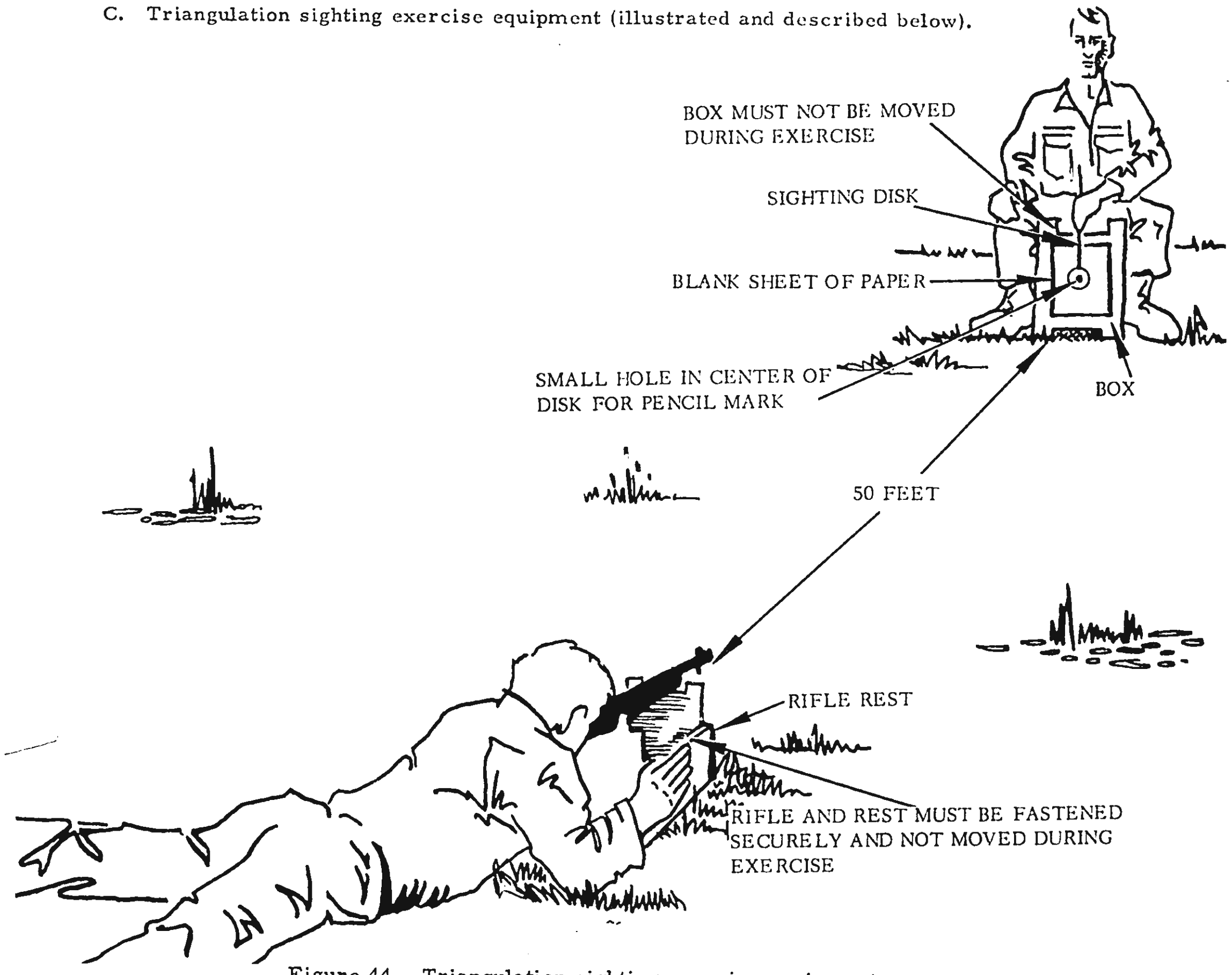


Figure 44. Triangulation sighting exercise equipment.

Shooter, person A, looks through sights without touching rifle while marker, person B, moves target according to the shooter's directions. A centers target in the sights according to proper sight alignment and picture three times attempting to have B place each pencil mark within 1/4" of each other on the blank sheet of paper. It is important that neither the rifle nor the sheet of paper is moved while any of the three sight pictures is found. (NOTE: Remove bolts from all actions during this exercise.)

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