



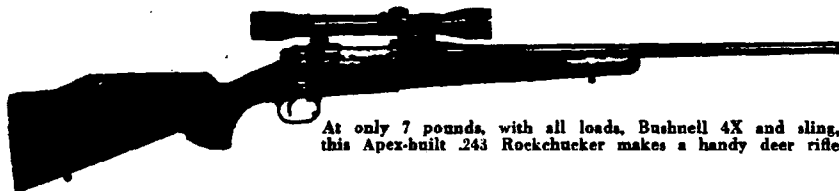
## 6 in the

**E**VERY shooting writer rides a pet hobby-horse. Some of us fork two or three. For the past half-dozen years one of mine—and a very active hobby-horse too—has been the 6 mm. or .243 caliber. No galloping alone, either, because there's a fast-spreading group of 6 mm. hobby-horse riders like myself. In the picket fence of modern centerfire rifle calibers and cartridges there aren't many gaps left to be filled; but to my way of thinking there's a fat hole between .22 and .25 which can be filled with a .243, a cartridge which will do virtually any job shooters usually assign to either the .22 or the .25 centerfires, and do some of them better than either. This opus is written primarily for wildcat fans—unless you happen to think, as many do including myself that the .243 has commercial possibilities.

In this country there never has been a commercial .243 cartridge since the 6 mm. Lee Navy. That one was a sort of incubator baby in that it was born before modern powders or modern ballistic ideas really gave it a chance. The rifles built for it were hardly howling successes, either, and the Lee is now in limbo. For nearly a shooting generation, however, the English .240 Holland & Holland, a pint-sized magnum, has not only kept itself alive but earned a place in the arsenals of the shooting gents overseas. Essentially a magazine rifle cartridge, it appears even in double rifles, and scores deadly success



Of the dozens of .243 wildcats, these six work very well— .243 Rockchucker, .240 Cobra, a .240 on .308 brass by gun editor Page, the .243 Ackley, .240 Krag and the .240-250



At only 7 pounds, with all loads, Bushnell 4X and sling, this Apex-built .243 Rockchucker makes a handy deer rifle



Michigan swamp thickets may not be ideal for .243 speeds but this buck dropped at the punch of 90 grains at 3300

on medium sized game, from assorted tropical pigs to the stags of the Scottish highlands.

Yet we have in wildcat form in this country close to a baker's dozen 6 mm. or .243 cartridges which equal or surpass this English junior magnum or its other British counterparts such as the .246 Vickers. And they aren't in any sense impractical or screwball wildcats. The .243 Rockchucker, very simply made by running a .257 case through a .243 RC sizing die to give it a slightly lengthened neck and a thirty-two degree shoulder, is one. The .240 Cobra which is made by necking out and then fire-forming .220 Swift brass, is another. My own idea, the .240 P.P. a .240 version of the .308 renecked and given a 30° shoulder by one passage through a sizing die, holds equal potential but is still in experimental stages.

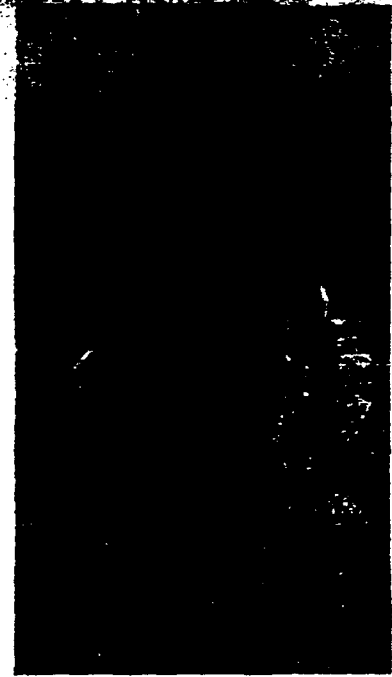
In the sense of proven ballistics there's little to choose between the first two, as the velocity table indicates. Either outdoes the much longer English cartridge, albeit I am sure the pressures run higher in the U.S. loads as they do even in standard cartridges. In terms of accuracy, any difference depends more on rifle and bullet than on the case, as will be detailed later. In terms of

# Family...

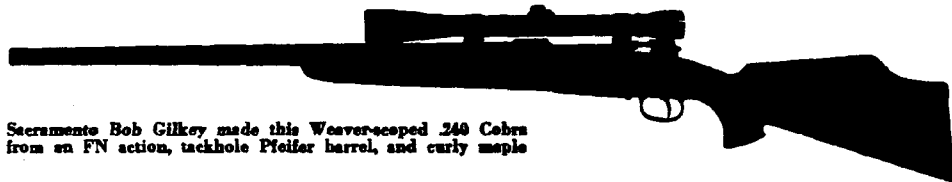
For varminting, and game the size of deer, the 6 mm. or .243 draws national interest, demands a place in the high-velocity family

flexibility of use, the .243 Rockchucker edges the Cobra. Its rimless case feeds smoothly through any action; whereas the semi-rim on Swift brass creates an acute nuisance in rapid-fire shooting unless the magazine box is rigged with a slanting filler plate as in the Model 70 Swift rifles, to force the shooter to load each round with its rim ahead of the rim edge of the cartridge under it. Even then feed is not foolproof. Hence if the Britishers' .240 H & H is a useful game and varmint cartridge, we have at least two similarly useful, with the .243 Rockchucker, which was originally experimented with by Californian Fred Huntington, the more practical of the two. Either, like my .240 on the .308 case, functions through a short action. In fact, I believe either the .243 Rockchucker or a cousin of my .308 case would have distinct commercial possibilities if factory-loaded for suitable rifles made in this country.

With my neck already out a bit on that point, I'll stick it out further and say that any of our .243 wildcats that



Long range and a breeze didn't stop the .243 bullet from picking off this rare jet-black chuck in upper New York state. No better at 150-200 yards, the .243's outshoot the .22's from 300 yards on out, holding velocity and bucking the wind far better



Sacramento Bob Gilkey made this Weaverscoped 240 Cobra from an FN action, tackhole Pfeiffer barrel, and curly maple

will drive 85 grains of bullet at 3400 plus, 90 grains at close to that, and 100-grain bullets at over 3200 with sane loadings qualifies not only as a fine long-range vermin poison, but also as an acceptable cartridge for antelope, deer, and critters of similar weight.

There's plenty of evidence on this point without benefit of ballistic numbers. Down in Lampasas, Texas, for example, I know a number of fellow .243 bugs headed up by gunsmith Harold Harton. They have been slaying Texas whitetail with Cobras, Rockchuckers, and the like for the past several years. The score on this past fall is not all in, but at least six bucks were tumbled at ranges from twenty-five to four hundred and forty paces. None traveled more than a few steps after being hit; none were lost. Of the assorted bullets the Texans tried, all of them lighter than 90 grains, half went through, the others broke up in the animal with considerable tissue destruction. Although Texas whitetail rarely gut out over a hundred and twenty-five pounds, their conclusion is that the .243's kill as well as the .257.

How about deer that run at least twice the weight of a heavy buck antelope? In Colorado last fall a shooting

buddy plastered his fine muley at 350 yards, shooting prone with a short magnum job that drives the 100-grain Sierra bullet at well over 3200 feet per second. Hit behind the shoulder, the deer staggered in shock long enough so that brother Hooker put in another needless hit in the boiler works.

A Wyoming gun bug friend has not only regularly killed mule deer and antelope with a 6 mm. and 90-grain bullets, but has also dropped several elk. A six or eight hundred pound bull I think is stretching matters for any save the most expert rifleman, but his evidence further strengthens the case for the 6 as a deer and antelope load.

How about Eastern whitetail? Bill Cotter and Mike Walker have been killing deer with assorted 6 mm's for the past five or six years, usually working in a Nova Scotia hunt as well as Pennsylvania, New York, or Michigan operations to increase their tallies. Collectively they've hung up a score of deer. They admit to losing a couple that were badly hit—but you can lose deer even with a .375! So, far from worrying about the too-quick blow-up which is usually associated with the extremely

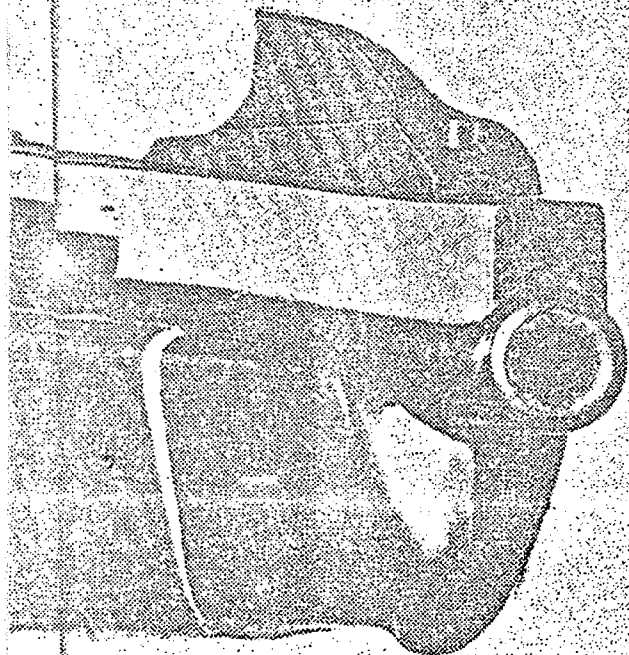
*File*  
*XP-100*  
*ADV*

If you think that rifles are the

only weapon

It was a beautiful sunrise. The big crimson ball crept up behind icicle-shaped segments of larger, cold, blue-gray clouds edged in hues ranging from chilly lemon to bright, gold-tinged ocher—all with but faint promise of warmth for our shivering bodies. □ We were woodchuck hunting and the frosty dew on the close-cropped, tawny-splashed meadow grass gave us tiny winks as if sympathizing with our sorry predicament. □ Standing

there that Saturday morning, quivering like spanked pups, we were surrounded by one of the best woodchuck-hunting areas I have known. The natural terrain was contoured to form perfect backstops for our high-velocity bullets in almost all directions. It was milk-making country, and the dairymen, who had known us for several years, were friendly because they knew we were careful in placing our shots, and they welcomed our efforts in keeping down the varmint population. □ The evening before, we had driven the hundred or so miles to our ground-hog stronghold, intending to sleep com-



*A New Remington pistol  
for .221 Fire Ball car-  
tridge has Bushnell  
Phantom scope.*

**XP-100**

**use for varmint hunting, take another look...at the new Remington...**

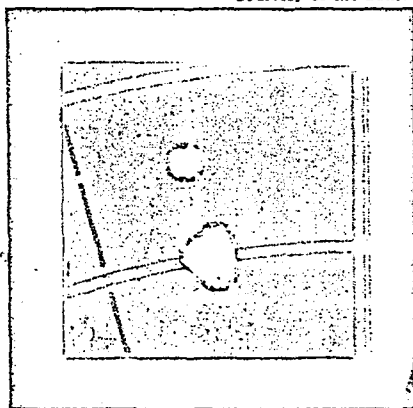
fortably snuggled down in one of the hay barns. Our clothing was nothing more than thin summer chinos. One of the those sharp, early-autumn cold snaps caught us flat-footed, and we were sorely disillusioned about the warming qualities of baled hay in a well ventilated barn. After a night that seemed to last forever, we were greeted by the steely-eyed dawn. □ The point I want to make is that varmint hunters as a breed will go to great lengths following the sport—first, acquiring suitable arms and then doing painstaking detective work to locate game fields, all involving much time and effort, and sometimes including traveling great distances. Guns may be anything from standard production models to very elaborate custom-made jobs incorporating carefully thought-out ideas of the individual. □ Long-range shooting with specialized handguns is the latest development in varmint hunting. This phase has grown tremendously during the past few years and Remington Arms Company has just announced a red-hot new gun-cartridge combination, the Model XP-100 pistol and the .221 Remington Fire Ball cartridge, a team specifically designed for long-range work. □ Modern varmint hunting probably began with the development of the .22 Hornet cartridge in about 1930 by a group of dedicated woodchuck hunters. It caught the attention of ammunition sachems and was first produced by Winchester in 1932. It was considered excellent for use up to about 200 yards. □ At the time of the above-mentioned chilly outing, popular varmint medicine included such car- (Continued on page 111)

**BY PETE KUHLOFF / Photographed by James Pickands, II**

tridges as the .22 Hornet, .218 Bee, .220 Swift, .250-3000, .270, .30-06, the strictly hand-loaded Lovell cartridges, the 2-R Donaldson, .22 Varminter and other wildcats. My particular battery on the outing consisted of a .218 Mashburn Bee, which Mashburn had built for me, using a Winchester high-wall, single-shot action with Sukalle barrel, and a Winchester Model 70 of .220 Swift caliber. Both rifles were equipped with target-type scope sights, the M-Bee with a 15-power Lyman Super-Targetspot and the Swift with a Unertl of 24-power. I used the beefed-up Bee for shots up to around 150 yards, and the Swift for longer shots.

Those were good, accurate varmint rifles,

Courtesy of the author



well as in precise placement of shot while hunting big game and varmint.

As I mentioned, our very latest phase of precise long-range shooting is with the handgun and small-caliber cartridges engineered especially for varmint hunting. This sport is catching on like wildfire. The reason? These handgun-cartridge combos are amazingly accurate and furnish a real challenge for the shooting buff.

The first in this category was the .22 Remington Jet Centerfire Magnum cartridge announced in April, 1960, and the Smith and Wesson Model 53 revolver. At about the same time, Winchester-Western had developed the .256 Winchester Magnum cartridge. It proved too hot for handguns in current production, and Bill Ruger, of Sturm, Ruger and Company, developed the very excellent Ruger Hawkeye single-shot pistol and introduced it to shooters last year. In the past, I have given you a rundown on these sizzling numbers.

The introduction of the XP-100 marks the reentry of Remington into the handgun field. Remington handguns have been produced in great numbers throughout the years. It is said that the very first ones were of flintlock ignition, dating back to 1835 or earlier. I never have seen an

go in for shooting cup-and-ball revolvers.

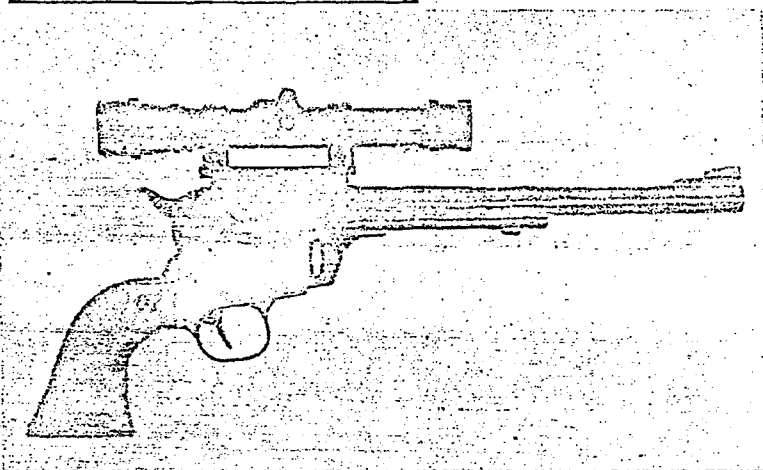
Remington cartridge handguns were made from about 1861 until 1934, with specialized single-shot target pistols produced as early as 1869. The target pistols, built with the famous Remington rolling-block action were of .22, .25 and .32 rimfire, and .32 and .44 centerfire calibers.

The new Model XP-100 has the characteristics of a target pistol. It truly is a product of the space age, and it has that look. At first glimpse, its modern design is a little startling. Although engineered for those who like long-range varmint and small-game hunting with the handgun, I believe it will see a lot of service as a target arm. In fact, the consensus among shooters who have experimented with the Remington .22 Jet and the .221 Fire Ball, and the .256 Winchester Magnum is that eventually, we will have standard target courses for guns handling these high-intensity cartridges, possibly including 50- 75- and 100-yard matches.

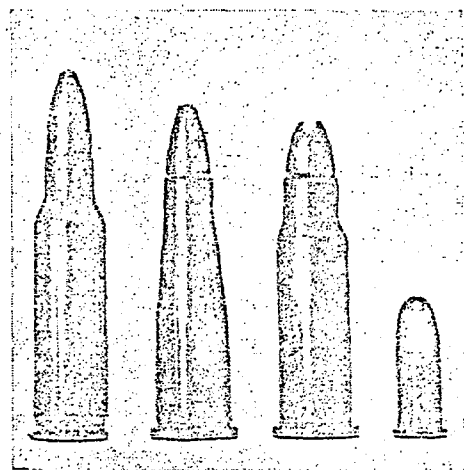
Take a look at the photograph of this new pistol (page 58). The chances are that it is entirely different from any other pistol you have seen. It certainly is no vest-pocket model. Over-all length is 16½ inches. The barrel measures 10½ inches and the sighting plane is approximately

Group was shot at sixty yards by the author using .221 Remington Fire Ball cartridge and the brand-new XP-100.

Hot handgun cartridges (actual size), from left: .221 Remington Fire Ball, .22 Remington Jet Magnum, .256 Winchester Magnum, .22 Short rimfire.



James Pickands, II



James Pickands, II

but I must admit that successful shots at much over 200 yards were few and far between. For distances up to slightly over 100 yards, we often fired from off-hand or from prone position with a sling, as circumstance permitted. A woodchuck is a small target, and at longer ranges, we looked for good rest positions, usually over stone walls with the rifle snugged cozily on a kapok-stuffed bag or pillow.

Things have changed in the varmint-hunting field. We have newer popular cartridges developed especially for long-distance shooting, and more and more sportsmen have become interested in rifles of calibers giving very flat trajectory and in making a hobby of shooting very small groups on extremely distant targets, as

Ruger Hawkeye pistol is being adapted for .221 Remington Fire Ball cartridge. The scope is the Jaeger-Nickel Supra.

example of a Remington flintlock pistol, and such guns have not been completely authenticated. The first Remington handgun made as a standard assembly-line design is the First Model Beals Pocket revolver, five-shot and of percussion ignition. Many thousand percussion pistols were manufactured from 1857 to 1888, although models factory-converted to take fixed cartridges were advertised as early as 1866. An outstanding percussion model is the .44-caliber, six-shot, New Army Model Revolver, 1863-1875, with more than 140,000 produced. This pistol is fairly well known to the enthusiasts who

6½ inches between the iron sights. A ventilated rib is installed on the barrel to improve the sighting plane. The open rifle-type rear sight, with square notch, is adjustable for windage and elevation. The front sight is 1/10-inch blade-on-ramp. The receiver is factory-drilled and tapped for scope-sight blocks.

The action of the XP-100 is similar to that used on Remington bolt-action centerfire rifles, with the well known ring of solid steel enclosing the cartridge head for utmost strength in cartridge support. To load, the bolt is brought to the rear position, then the cartridge is dropped onto the loading platform or incline in the receiver. Moving the bolt forward chambers the cartridge, and lowering the bolt



The grip and stock of the new gun are made with one piece of molded Du Pont Zytel structural nylon in Mohawk Brown color. You probably know that this material is very tough and maintains its dimensional stability under practically all conditions. This means that it does not warp or change shape and assures uniform metal-to-stock bedding—an important element in maintaining constant point-of-bullet impact and unvarying accuracy. The grip has fine checkering, and the stock is fancied up a bit with white-diamond inlays, contrasting black forearm tip with white spacer, and black trigger guard.

Of utmost importance in accurate shooting is a good trigger pull. The pull on the new gun which I have been shooting is excellent—clean and crisp, with letoff requiring a pressure of two pounds two ounces, and with a little very soft rearward movement after the break.

The first element most of us think of in a telescope sight is magnification. — Other things being equal, it is evident that the

The important advantage of the scope on a handgun is in the ease of sighting. With open sights, the eye has to line up three elements at different distances—the rear sight, the front sight and the target. The eye can focus only at one distance at a time, so, with the open sights, it rapidly focuses from one to the other in an effort to align them—a very difficult task for all but very young eyes. On the other hand, in a scope, an image of the target is focused exactly upon the reticle (crosshair) and the relation of the reticle and target remain fixed on one plane independent of the shooter's eye and is easy to see. With metallic sights, besides the focusing problem, the position of the eye is critical, while with the scope, it is necessary only that the eye remain within the area of the exit pupil. So, if the exit pupil is very small, nothing is gained with regard to eye position. With a large exit pupil, the position of the shooter's eye may vary considerably without interfering with the accuracy of aim. A large exit pupil is desirable. But it can be obtained only with low magnification or a large objective lens—and the latter is impractical on a pistol scope.

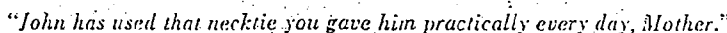
My original intention was to shoot at a distance of 100 yards, but due to lousy

The first five-shot group just about spoiled me. It measures under  $\frac{1}{2}$  of an inch, center to center of bullet holes farthest apart (see the actual size reproduction on page 113). The first three shots printed in one hole, the fourth was a little high and the fifth went home into the original hole. The four shots of the group measure about 5/32 of an inch. *This is good rifle accuracy!* And that is just what the XP-100 gives at reasonable ranges.

Being anxious to try the Fire Ball on varmint, I began to look around. My eye hit on a couple of crows on a patch of thin snow, snooping around. I spotted the black rascals from a window and sneaked out the back way with the XP-100 in one hand and a Fire Bull cartridge in the other. Shielded by some evergreen trees, I finally found a rest on one of the limbs, put the crosshair on the black spot and squeezed the trigger. The hit was almost dead center and feathers flew. Results indicated good bullet expansion. The distance was at least eighty yards.

Mid-range trajectory figures in inches for the .221 Fire Ball are: 50 yards—0.2; 100 yards—0.8; 150 yards—1.9; 200 yards—3.9; 250 yards—6.9; 300 yards—11.3.

These figures are almost identical to those of the .22 Hornet cartridge when fired from a twenty-four inch rifle barrel. The flat trajectory curve of the bullet in flight, plus the superb accuracy given by the XP-100 pistol, furnishes a fascinating challenge for any shooter. • • •



# DOPE BAG

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Pistol Line Of Sight  
Non-Corrosive .38 Special  
Cases For 8.15 x 46R  
Bedding No. 4 Rifle  
Loading 20-ga. Shotshells  
Luger Lanyard Loop  
A. H. Fox Shotgun  
Gunstock Repair  
High And Low Brass  
Model 29 Mauser  
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## Data and Comment

### New Remington Rifles

Include center-fire and .22 rimfire bolt-action sporters

Many commercial and military arms are produced in closely-integrated groups commonly called gun families. All guns in a family, regardless of caliber, are basically alike in construction. This is advantageous to the manufacturer because it facilitates production. It can also be beneficial to the user. For example, more proficiency in handling may be attained if a hunter's center-fire rifle operates in the same manner as his .22 rimfire rifle.

Remington has long used the family of guns system, especially in the sporting arms modernization program following World War II.

Remington's most recent development is a family of turnbolt sporting rifles including the Model 788 center-fire and 3 adult-size .22 rimfire models, the 580 single-shot, 581 box-magazine repeater,

and 582 tubular-magazine repeater.

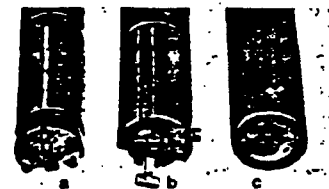
The larger rifle of the family, the Model 788 center-fire, features a tubular receiver with locking lug recesses behind the ejection port. It is offered in .222 Remington and .22-250 Remington for varmint shooting, and in .30-30 Winchester and .44 Remington Magnum for hunting deer and similar-size big game. The .44 Remington Magnum rifle has a short action, and a longer action is used for the other calibers.

Although not held in high esteem by many riflemen, a rear-locking action is of advantage in that cartridges do not have to cross a lug recess in the receiver. This aids reliability of feeding, especially with rimmed ammunition. Another advantage of rear locking is that it generally minimizes length of bolt stroke, which helps in speed of operation.

### Locking lug arrangement

Further aiding speed of operation in the Model 788 is the locking lug arrangement. Three series of lugs are spaced 120° apart, and bolt rotation is 68° instead of the usual quarter turn. There are 3 lugs per series totaling 9, giving a large well-distributed locking area.

To give locking strength, receiver and bolt walls are thick and openings in the receiver walls forward of the locking lugs are minimum size. The receiver and bolt body are machined alloy steel, and the receiver is forged by a special process. According to Remington tests, the



.22 rimfire separate bolt head (a) has twin extractors. Separate bolt head (b) of Model 788 chambered for rimmed cartridges. Bolt head (c) of Model 788 firing rimless ammunition is integral with bolt body.

Model 788 compares favorably in locking strength with the Model 700 rifle, which is among the world's strongest.

Brazed to the bolt body, the bolt handle has a bored-out knob to give lightness. Brazing is a strong method of fastening, but Remington engineers do not regard the handle as a safety lug even though it enters a notch located in the receiver.

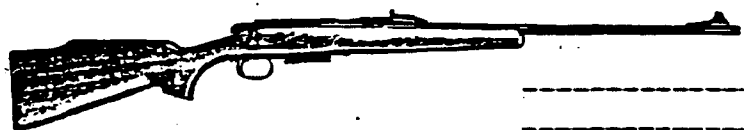
A one-piece bolt body counterbored at the front to fit the cartridge head is used in the version chambered for rimless cartridges. The extractor is horse-shoe shaped, and the ejector is a spring-loaded plunger.

To give reliable cartridge feed, the version firing rimmed ammunition has a separate bolt head which does not rotate in the receiver. Fitted to the head are a long spring-loaded extractor, rectangular-shaped ejector, and a guide pin to prevent rotation.

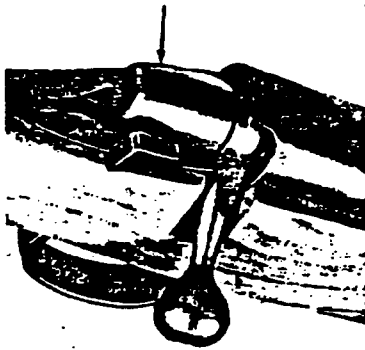
### Specifications

#### REMINGTON MODEL 788 RIFLE

Mechanism Type: Bolt-action, detachable box magazine  
Caliber: .222 Remington (also .22-250 Remington, .30-30 Winchester, and .44 Remington Magnum)  
Weight: 7 lbs. 10 ozs.  
Barrel Length: 24" (.22" in .30-30 Winchester and .44 Remington Magnum)  
Over-All Length: 43 1/2"  
Magazine Capacity: 4 rounds (3 rounds in .22-250 Remington, .30-30 Winchester, and .44 Remington Magnum)  
Stock Dimensions: Length of pull, 13-9/16"; drop at comb, 1 1/8"; drop at Monte Carlo, 1 1/8"; drop at heel, 2 1/4"  
Sights: Blade front on serrated ramp; fully-adjustable U-notch rear; receiver drilled and tapped for top scope mount and receiver sight  
Sight Radius: 19-9/16"  
Rifling: 6 grooves, right twist, one turn in 14"  
Price: \$84.95



Remington Model 788 rifle, cal. .222 Remington.



Bolt sleeve (arrow) of Model 788 is not bored through at the rear for firing mechanism. Safety is positioned conveniently to right of bolt sleeve.

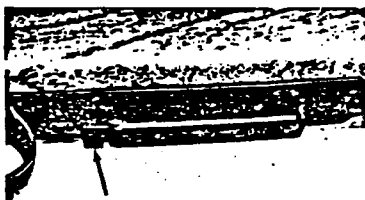
Driven by a coil spring, the cocking piece and one-piece firing pin are cocked by cam action as the bolt is turned open. The firing pin fall is about .3" and the lock time 2.36 milliseconds—exceptionally fast for a bolt-action center-fire rifle.

Gas protection is provided by the bolt sleeve which is not bored through for the cocking piece. A small hole extending laterally through the sleeve is used when disassembling the firing mechanism from the bolt. Clear instructions for field disassembly, operation, and maintenance are furnished.

The single-stage trigger mechanism is non-adjustable. Pivoted to the right of its housing is a thumb-operated safety. In its safe position to the rear, the safety blocks the trigger and prevents the bolt from being opened. When pushed all the way forward, it depresses the bolt stop to permit removal of the bolt. If the firing mechanism is not cocked, the safety cannot be set on safe. This serves as a cocking indicator.

Of single-column type, the detachable box magazine holds four .222 Remington cartridges or 3 rounds in other calibers. It is guided by a bar extending from the bottom of the receiver. The magazine release is on the lower rear of the magazine which permits easy detaching with one hand.

The lightweight tapered barrel is full-floating in the fore-end. It is fitted with a fully-adjustable open rear sight, blade front sight with ramp base, and a serrated plastic rib at the rear to aid ap-

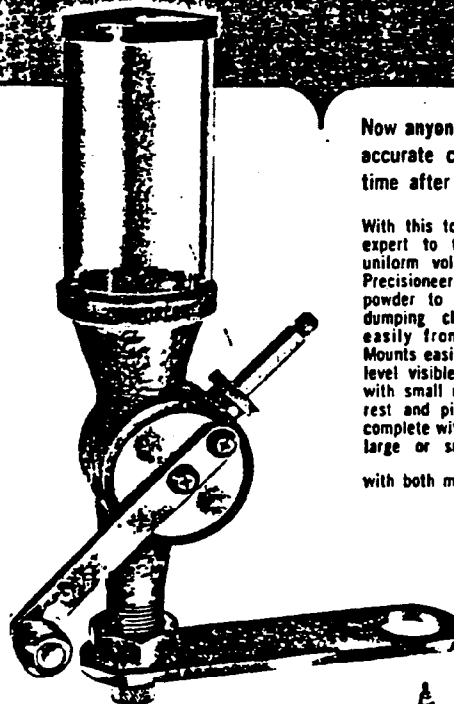


Magazine latch (arrow) of Model 788 is on lower rear of magazine.

APRIL 1967



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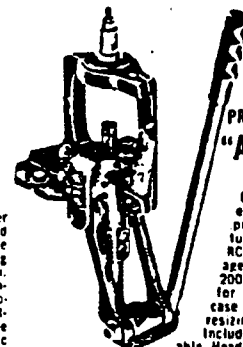
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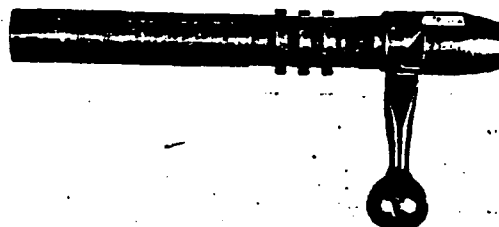
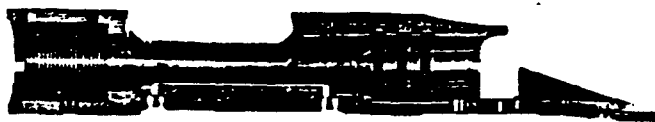
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DOPE BAG continued



Model 788 bolt and sectioned receiver.

pearance. Clamped between the barrel and receiver is a recoil lug with a small upper extension to serve as a stop for the scope mount. Holes in the receiver for attaching a receiver sight and top scope mount are threaded for 8x40 screws which are much stronger than the 6x48 screws customarily used. Scope mounts and receiver sights for this rifle are being developed by various U.S. sight manufacturers.

Solidly held to the receiver with front and rear guard screws, the well-proportioned black walnut stock is gloss finished. It has a pistol grip and Monte Carlo comb, and is fitted with a black plastic buttplate.

Except for the lightweight alloy trigger housing, metal parts are steel with exterior surfaces blued. Several parts such as the magazine box and trigger guard are stamped steel.

All three .22 rimfire members of this rifle family are designed for small game hunting and plinking, and fire .22 short,

long, and long rifle regular and high speed cartridges interchangeably and without adjustment. Except for cartridge feed in 2 models, these rifles are essentially scaled-down versions of the Model 788. However, each rifle has 6 locking lugs (2 series with 3 lugs per series), or 3 less than the 788. This locking system is much stronger than required for .22 rimfire cartridges, but its similarity to that of the Model 788 permits production of the whole rifle family with the same basic machines.

The .22 rimfire bolt has a separate non-rotary head equipped with twin extractors. Unlike the Model 788, the firing pin is of 2-piece construction with the front part in the bolt head. Another feature different from the Model 788 is that the front of the bolt head is beveled to permit gas escape through the ejection port. This is an excellent safety feature since rimfire case heads sometimes burst, especially when firing high speed ammunition.

A loading platform in the Model 580 single-shot rifle facilitates loading. The Model 581 has a detachable box magazine made of black plastic, and the Model 582 features a tubular magazine under the barrel. In the Model 582, the orange-color plastic magazine follower is visible through the ejection port when the magazine is empty.

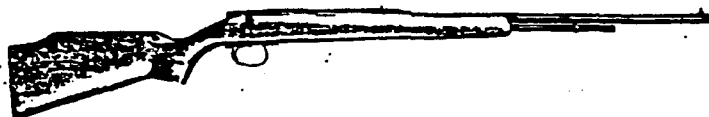
In all the .22 rifle models, a single large screw holds the walnut stock to the barrel and action. It can be easily turned out with a coin or large screwdriver to take the rifle down for cleaning or carrying.

An open U-notch rear sight adjust-

### Specifications

#### REMINGTON MODEL 580 RIFLE

Mechanism Type: Bolt-action, single shot  
Caliber: .22 short, long, and long rifle  
Weight: 5 lbs.  
Barrel Length: 24"  
Over-All Length: 42 3/4"  
Stock Dimensions: Length of pull, 13-5/16"; drop at comb, 1 1/4"; drop at Monte Carlo, 1-13/16"; drop at heel, 2 1/4"  
Sights: Bead front (can be driven laterally); U-notch rear adjustable for elevation; top of receiver grooved for standard tip-off scope mounts  
Sight Radius: 19 1/4"  
Rifling: 6 grooves, right twist, one turn in 16"  
Price: \$34.95



Remington Model 582 rifle, cal. .22 short, long, and long rifle.

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#### Specifications

##### REMINGTON MODEL 581 RIFLE

Mechanism Type: Bolt-action, detachable box magazine  
Caliber: .22 short, long, and long rifle  
Weight: 5 lbs. 4 ozs.  
Barrel Length: 24"  
Over-All Length: 42 3/4"  
Magazine Capacity: 5 rounds  
Stock Dimensions: Length of pull, 13-5/16" drop at comb, 1 3/4"; drop at Monte Carlo, 1-13/16"; drop at heel, 2 3/4"  
Sights: Bead front (can be driven laterally); U-notch rear adjustable for elevation; top of receiver grooved for standard tip-off scope mounts  
Sight Radius: 19 1/4"  
Rifling: 6 grooves, right twist, one turn in 16"  
Price: \$44.95

#### Specifications

##### REMINGTON MODEL 582 RIFLE

Mechanism Type: Bolt-action, tubular magazine  
Caliber: .22 short, long, and long rifle  
Weight: 5 lbs. 4 ozs.  
Barrel Length: 24"  
Over-All Length: 42 3/4"  
Magazine Capacity: 20 short, 15 long, 14 long rifle  
Stock Dimensions: Length of pull, 13-5/16"; drop at comb, 1 3/4"; drop at Monte Carlo, 1-13/16"; drop at heel, 2 3/4"  
Sights: Bead front (can be driven laterally); U-notch rear adjustable for elevation; top of receiver grooved for standard tip-off scope mounts  
Sight Radius: 19 1/4"  
Rifling: 6 grooves, right twist, one turn in 16"  
Price: \$49.95

able for elevation and a bead front sight that can be driven laterally for windage comprise the sighting equipment. The top of the receiver is grooved for standard tip-off scope mounts.

#### Performed well

A Model 788 rifle in caliber .222 Remington and a Model 582 tubular-magazine repeater were evaluated. Various makes of factory ammunition were fired in these rifles, and there were no malfunctions. The actions operated easily and smoothly, and trigger pulls were crisp. Weight of pull was 5 lbs. for the Model 788 and 4 lbs. for the Model 582, which is satisfactory for sporting use.

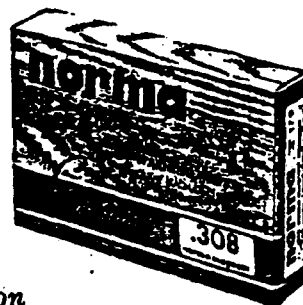
In loading the Model 582 singly, inserting cartridges into the chamber was not easy because of the small ejection port. This is a minor criticism since the rifle is normally used as a repeater.

Both rifles gave excellent results in accuracy tests. The Model 582 was fired from artificial support indoors at 25 yds. Best results were obtained with .22 long rifle match ammunition. The average extreme spread for five 10-shot groups was 1.24 M.O.A. (minute of angle), with .88 M.O.A. for the smallest group and 1.68 M.O.A. for the largest.

Due to winter weather, the Model 788 was also fired indoors at 25 yds. A 12X scope was used on the rifle, and firing was done from bench rest using factory

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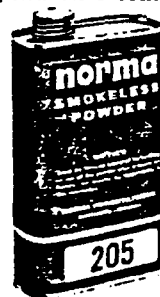
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## DOPE BAG continued

ammunition with 50-gr. soft-point bullets. The average extreme spread of five 5-shot groups was 1.04 M.O.A., with the smallest group .84 M.O.A. and the largest 1.16 M.O.A.

These handsome well-made rifles more than meet accuracy requirements for their intended use. Moderately priced, they are particularly well suited for those who want a bolt-action deer or varmint rifle and a companion .22 rimfire rifle for small game hunting.

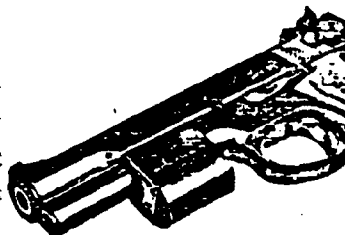
Manufactured by: Remington Arms Co. Inc., Bridgeport, Conn. 06602.

## S&W Model 52-1

Center-fire target pistol made with single-action trigger

The Single Action .38 Master Model 52-1 pistol now offered by the Smith & Wesson firm is a mechanically improved version of the S&W Model 52 pistol originally introduced in 1962. The main change in this arm is in the trigger mechanism. To improve the trigger pull for tournament shooting the double-action feature with lockout screw has been eliminated. Commencing with gun No. 55,001 the trigger linkage and related parts have been redesigned. Very close adjustment of the trigger stop screw is now possible. A relocated safety notch on the hammer helps to prevent it from rebounding to the safety notch when dry-firing. The new model is supplied with two 5-round magazines; cleaning rod, brush and swab; bushing spanner wrench; and 2 Allen wrenches.

The frame forward of the trigger guard of the new model is machined and spot drilled to accept 2 accessory 3-oz. blued steel counterweights, one screwing to the bottom of the other. Also, the trigger of the Single Action is



Counterweights attached to frame of S&W Model 52-1 pistol.

more curved, which allows both better trigger control and uniform trigger finger placement from shot to shot than does the trigger of the older model.

The trigger pull is 'soft'. Weight of trigger pull is adjustable by exchanging sear springs of different sizes. The weight of pull of the gun tested by NRA is a uniform 3 lbs. Minimum trigger pull weight specified by NRA rules for this caliber gun is 2 1/4 lbs.

### Specifications

#### SMITH & WESSON SINGLE ACTION .38 MASTER, MODEL 52-1 PISTOL

Mechanism Type: Semi-automatic, locked breech, recoiling barrel, detachable magazine

Caliber: .38 Special mid-range wad-cutter ammunition with flush-seated bullet only

Weight: 2 lbs. 8 ozs.

Barrel Length: 5 1/4"

Over-All Length: 8 3/4"

Magazine Capacity: 5 rounds

Sights: Ramp mounted, 1/4" blade, fixed

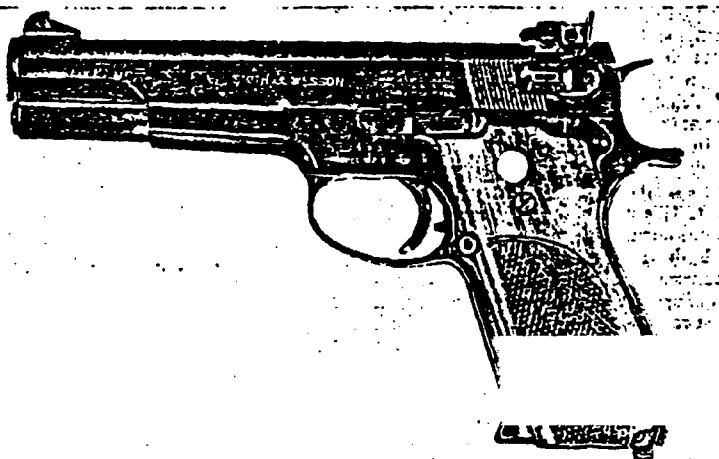
Patridge front; 1/4" square notched, fully adjustable rear

Sight Radius: 6-15/16"

Rifling: 5 grooves, right twist, one turn in 18 1/2"

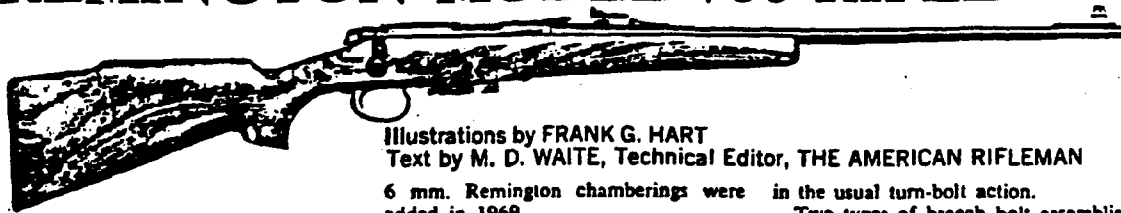
Accessories: Bushing spanner wrench, 2 Allen wrenches, cleaning rod with brush and swab, second magazine

Price: \$165. Set of 2 counterweights, \$10



S&W Single Action .38 Master Model 52-1 pistol for target shooting with .38 Special mid-range ammunition in which the bullet is seated flush with the case mouth.

# REMINGTON MODEL 788 RIFLE



Illustrations by FRANK G. HART

Text by M. D. WAITE, Technical Editor, THE AMERICAN RIFLEMAN

6 mm. Remington chamberings were added in 1969.

The rear locking action of this rifle is an advantage in that cartridges do not have to cross a lug recess in the receiver ring as they feed from the magazine to the chamber. This contributes to reliable feeding, especially with rimmed cartridges.

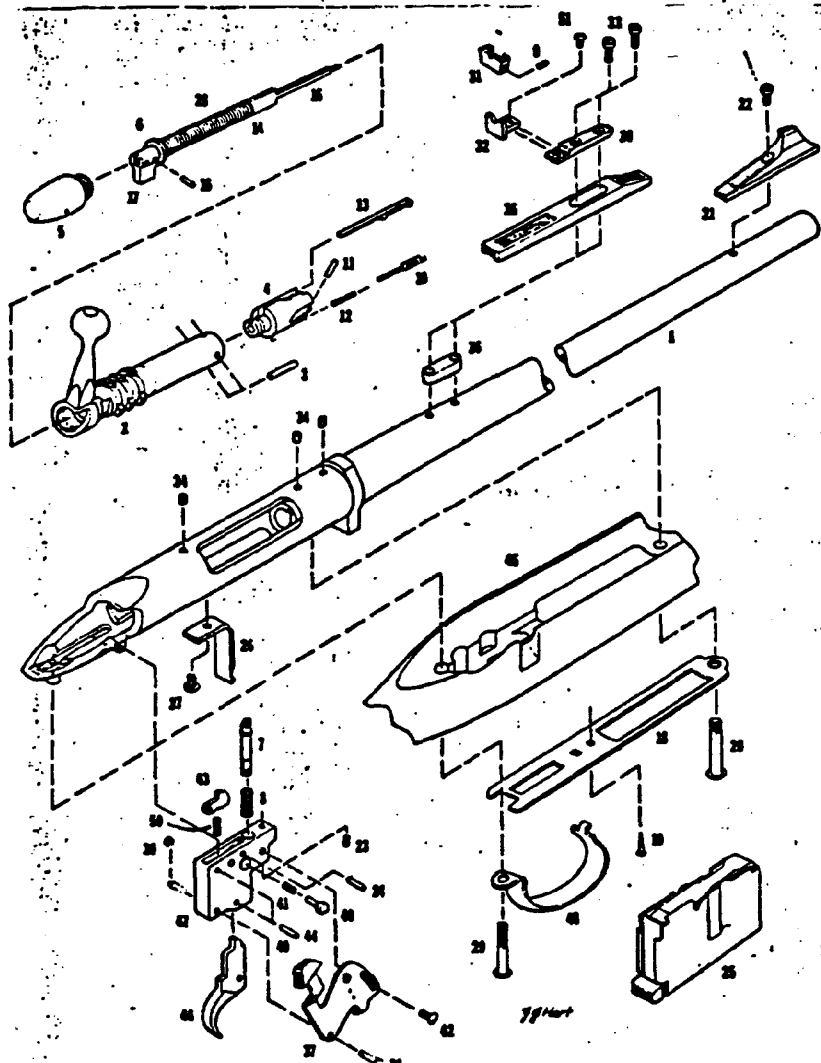
The nine bolt locking lugs are arranged in three series of three lugs each with each series spaced 120° apart. Bolt rotation is 68° instead of 90° as

in the usual turn-bolt action.

Two types of breech bolt assemblies are used with this rifle. Type No. 1, with rotating bolt head, is employed with the rimmed calibers. Type No. 2, of one-piece design, is used for the rimless calibers.

Receiver of the Model 788 is drilled and tapped for top scope mounts and metallic receiver sights. Trigger pull is adjusted at the factory. An extremely fast lock was designed into this rifle to enhance its performance in the field. ■

**F**EATUREING a tubular receiver with nine bolt locking lugs engaging locking recesses within the receiver bridge, the Remington Model 788 bolt-action rifle was introduced in 1967. A sporting rifle, the Model 788 was chambered initially for a variety of center-fire deer-class and varmint cartridges including the .30-30, .44 Remington Magnum, .222 Remington and .22-250 Remington. The .308 Winchester and



## PARTS LEGEND

- |  |                                       |
|--|---------------------------------------|
| 1. Barrel assembly (includes receiver) | 26. Magazine guide bar                |
| 2. Bolt*                               | 27. Magazine guide bar screw          |
| 3. Bolt assembly pin*                  | 28. Mainspring                        |
| 4. Bolt head*                          | 29. Rear guard screw                  |
| 5. Bolt plug                           | 30. Rear sight base                   |
| 6. Bolt plug washer                    | 31. Rear sight eye-piece              |
| 7. Bolt stop                           | 32. Rear sight leaf                   |
| 8. Bolt stop spring                    | 33. Rear sight screw (2)              |
| 9. Elevation screw                     | 34. Receiver plug screw (3)           |
| 10. Ejector*                           | 35. Rib (rear sight)                  |
| 11. Ejector pin*                       | 36. Rib spacer (rear sight)           |
| 12. Ejector spring*                    | 37. Safety                            |
| 13. Extractor*                         | 38. Safety pivot pin                  |
| 14. Firing pin assembly                | 39. Safety pivot pin retaining washer |
| 15. Firing pin                         | 40. Safety plunger                    |
| 16. Firing pin cross pin               | 41. Safety plunger spring             |
| 17. Firing pin head                    | 42. Safety retaining screw            |
| 18. Floor plate                        | 43. Sear                              |
| 19. Floor plate screw                  | 44. Sear pin                          |
| 20. Front guard screw                  | 45. Stock                             |
| 21. Front sight                        | 46. Trigger                           |
| 22. Front sight screw                  | 47. Trigger housing                   |
| 23. Housing lock screw                 | 48. Trigger guard                     |
| 24. Housing pin                        | 49. Trigger pin                       |
| 25. Magazine assembly                  | 50. Trigger spring                    |
|  | 51. Windage screw                     |

\* Used on .30-30 and .44 Remington Magnum calibers only.  
NOTE: Buttplate and buttplate screws not shown on drawing.

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# RIFLE AND SHOTGUN SHOOTING

<sup>54</sup>  
P 53-54-55-68-69-70  
71 & 72



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The secret to successfully earning a merit badge is for you to use both the pamphlet and the suggestions of your counselor.

Your counselor can be as important to you as a coach is to an athlete. Use all of the resources your counselor can make available to you. This may be the best chance you will have to learn about this particular subject. Make it count.

If you or your counselor feels that any information in this pamphlet is incorrect, please let us know. Please state your source of information.

Merit badge pamphlets are reprinted annually and requirements updated regularly. Your suggestions for improvement are welcome.

Send comments along with a brief statement about yourself to:

**Scouting Division  
Boy Scouts of America  
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## **RIFLE AND SHOTGUN SHOOTING**

By Col. Edward B. Crossman



**1977 Printing of the  
1967 Edition**

**BOY SCOUTS OF AMERICA  
NORTH BRUNSWICK, NEW JERSEY**





## Requirements

### 1. Do the following:

a. Explain the meaning of each point in the Shooter's Safety Code. Agree to live up to it.

b. Write 200 words on "My Responsibility as a Shooter."

c. Explain the main points of the laws for owning and using guns in your town.

d. Explain how guns are related to wildlife conservation.

e. Explain the main points of the hunting laws in your state. Tell the kinds of game which may be hunted. Give any special laws on the use of guns.

f. Explain how a good sportsman acts when handling guns.

### 2. Do the following:

a. Describe two main differences between the rifle and the shotgun. Explain how these differences affect their use in the field.

b. Draw and explain proper sight alignment and a proper sight picture with the rifle and the shotgun. Explain how these differences affect their use in the field.

c. Explain the principles of good rifle shooting positions. Show three positions. Explain and show the differences between a good rifle shooting position and a good shotgun shooting position.

d. Explain and show the right use of the trigger in rifle shooting. Explain and show the right use of the trigger in shotgun shooting.

e. Explain and show shotgun

swing. Explain why "follow-through" is so important.

### 3. Do the following:

a. Explain the general principles of safe handling of guns and ammunition.

b. Explain the safety precautions for guns having fixed or detachable magazines. Tell the special precautions for tubular magazines.

c. Show how to check for safety the following:

- (1) Rifle or shotgun
  - (a) Semiautomatic action
  - (b) Pump action
  - (c) Break-open or hinge action
  - (d) Bolt action
  - (e) Lever action

- (2) Muzzle-loader of any kind
- (3) Gas, pneumatic, or air gun

d. Show the following:

- (1) Safe carrying of a gun when alone or with other hunters
- (2) Proper relationship of hunters when loading and unloading guns
- (3) Safe handling of a gun when taking it out of and putting it in a car
- (4) Safe gun handling when crossing a fence

e. Explain what is meant by "safe zone of fire."

f. Explain the principles of safe storage of guns and ammunition at home.

g. Explain what you would do if a friend visiting your home asked to see your target rifle.

h. Explain the care needed to keep a gun in good and safe working condition.

4. Meet the standards shown in either "Option A—Rifle Shooting" or "Option B—Shotgun Shooting."

## OPTION A—RIFLE SHOOTING

a. **Score required.** Make a total score of at least 380 points out of a possible 600 on a total of 12 targets. Include the following:

- (1) Four targets from the prone position, each scoring at least 35 points out of a possible 50
- (2) Four targets from the kneeling position, each scoring at least 25 points out of a possible 50
- (3) Four targets from the standing position, each scoring at least 20 points out of a possible 50

**Note:** You will have to make more than the minimum score on some targets to make the required total of 380 points.

b. **Specifications.** Qualification may be fired on any one of the following courses of fire:

- (1) The 50-Foot Course—fired with the .22-caliber rimfire rifle using the .22 cartridge. Use 50 foot A1, A2, A4, A5, A16, or A17 targets.
- (2) The 25 Foot Course—shot

- with any air gun or gas gun having a rifled barrel. Use 25 foot A18 or A19 targets.
- (3) The 15-Foot Course—shot with any smoothbore air or gas gun using BB's. Use 15-foot A45 or A46 targets.

*Range distance:* Measured from firing line to face of target.

*Number of shots:* Five shots per target.

*Sights:* Any not using glass.

*Targets:* Official BSA, NRA, or those issued by the director of Civilian Marksmanship.

*Sling:* The sling may be used only with the arm and hand supporting the barrel.

#### **OPTION B—SHOTGUN SHOOTING**

a. **Score required.** Break at least 13 clay birds out of a possible 25 in each of five separate 25-bird events.

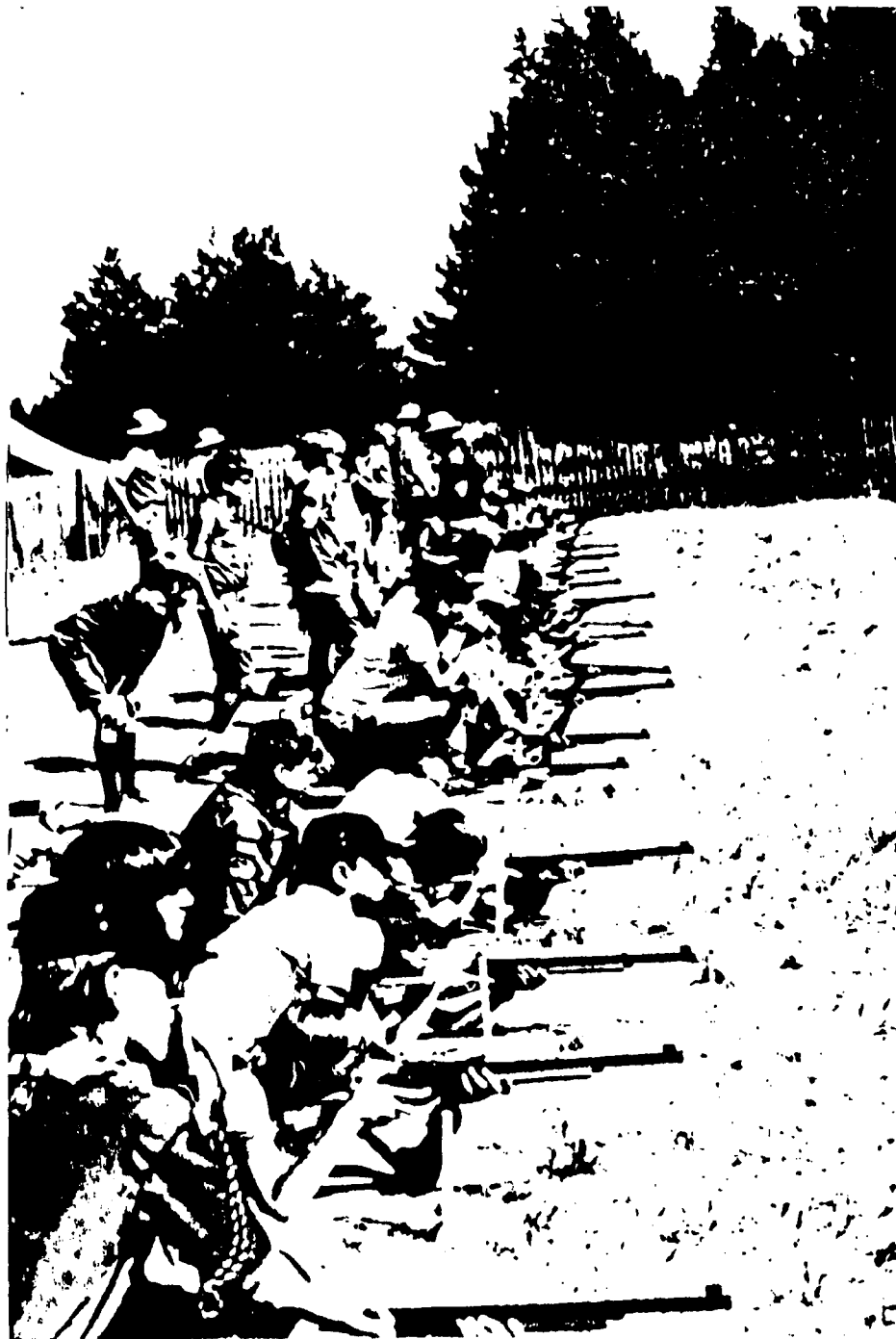
##### **b. Specifications.**

- (1) The .22-Caliber Shotgun Course—fired with .22-caliber smoothbore gun, using .22 rimfire shot cartridges. Targets must be of the Mo-Skeet-O type, about 2 inches across. Targets may be thrown from a hand or foot trap.
- (2) The Large Caliber Shotgun Course—fired with a standard shotgun of .410 gauge or larger. Targets shall be of the standard type, about 4½ inches across. Targets may be thrown from a hand or foot trap. Standard skeet or trap courses may be used.



## **CONTENTS**

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## THE SHOOTER'S SAFETY CODE

### A Scout:

Always follows the rules for gun safety.

Accepts the responsibility going with the use and possession of guns.

Follows the laws governing the use and possession of guns in his community.

Practices wildlife conservation.

Follows the spirit and letter of the game laws.

Is especially careful to be a true sportsman when using guns.

# Gun Safety and Conservation

**Ia Explain the meaning of each point in the Shooter's Safety Code. Agree to live up to it.**

The Shooter's Safety Code is not a mere list of safety precautions, important as safety is to all of us. As you will see later, we will cover safety in nearly all the other requirements. Instead of just covering safety, the code lists a set of basic principles which are necessary for you to know and to follow when you start handling guns. These principles apply whether you are a hunter or a target shooter, whether you own a gun or borrow one, whether you are a serious, devoted shooter or just a casual tin-can shooter. Although the code includes matters other

than safety, we have used the name "Shooter's Safety Code" to remind you first, last, and always of safety with firearms. If you follow the code you will handle guns safely. More than that, however, if you follow the code, all its principles will combine to make you a knowledgeable and expert gun user—and help to make you a good citizen.

### Responsibilities

**1b Write 200 words on "My Responsibility as a Shooter."**

Carelessly used, a gun can be very dangerous. Every time you pick up a gun, you pick up the responsibility for using that gun safely, both to protect yourself and to protect the people around you and the community in general. If you are a gun owner, you accept the responsibility of keeping the gun and its ammunition under careful control so that untrained people cannot get at them. You accept the responsibility of teaching those in your home whatever is necessary to keep them from hurting themselves or others with your gun.



When you are shooting on the range, you accept the responsibility of complying with all the range rules, especially those dealing with safety. Whether you are shooting or not, you watch carefully to see that others follow the principles of safety.

When you are hunting or shooting in the field, you accept the responsibility of following the regulations concerning the use of guns, as well as the responsibility of knowing and following the game laws. As a true sportsman, you accept the responsibility of knowing where your bullet will stop and of shooting only at proper targets. You accept the responsibility of cooperating with the landowner.

These responsibilities are covered in more detail in the discussions on the various requirements. Don't think the responsibilities we have listed in this paragraph or even those in the remainder of this pamphlet are all; you may well recognize other responsibilities which go with the possession and use of a gun.

### Knowing the Laws

**1c Explain the main points of the laws for owning and using guns in your town.**

At one time in this country, practically anyone could own, carry, and use a gun. In fact, it often was a necessary item for

personal protection against wild animals or against lawless men.

With the development of law and order, the necessity for carrying a gun all the time was reduced. Because guns have been used hastily in moments of anger or handled by people without proper knowledge of their use, most communities have found it necessary to limit the normal carrying of a concealed weapon to those who have a real need.

As communities developed and the land became more populated, it no longer was safe to step outside the front door and shoot a gun in any direction without looking. Therefore, most areas have found it necessary to put restrictions on how and where you can shoot a gun.

Some types of people have shown that they cannot satisfactorily accept the responsibilities that go with ownership and use of a gun, and many communities have passed laws forbidding gun ownership by narcotics addicts, exconvicts, and others.

The laws governing the ownership and use of guns may be made at Federal, State, county, or city level. Your local law-enforcement officer should be able to give you advice on this subject. Your merit badge counselor can also help you.

There are also restrictions on guns and their use in connection with hunting, but we will cover these in a later requirement.

## Wildlife Conservation

### 1d Explain how guns are related to wildlife conservation.

Wildlife biologists have long recognized two major factors in game management. The first is that you cannot stockpile wildlife.

With some exceptions, a given piece of ground can support only a given number of one type of wildlife. If you decide that you would like to have more game of a certain kind in that area and you stock it heavily with extra

enough animals each year for breeding and for ensuring that only the strongest strains survive for reproduction. Starting with 100 pheasant eggs in June, there will be 50 chicks by the first of August, 25 grown birds by the first of October, but less than 10 birds left by next May. Only about 8 percent of young rabbits grow to breeding age.

These principles apply generally, almost regardless of what you do to the animals. If you put extra animals in the area, they



animals, what will happen? If you go back in a year or so, you won't find any increase in the number of animals. Starvation, disease, or predatory animals will have taken the extra ones.

The second factor of importance is that nature overproduces every year -- produces far more animals than the area can support. And as we saw above, the excess is lost nature's way of making sure that there are

will die. If you kill or trap extra animals, the remaining stock will soon bring the population up to the normal figure. Since it doesn't seem to matter to nature how the surplus animals are killed, game management experts try to arrange the hunting seasons and the bag limits so that this surplus can be harvested by hunters. Far better that the hunter should get the healthful outdoor recreation -- and the meat

--harvesting the surplus than to lose it to disease, starvation, and other natural causes.

Occasionally a group of animals will apparently violate the principles we have been discussing. For a few years, there will be a larger carry-over than the land can support properly.

When it is obvious that the carry-over is too large, it is most important to increase the harvest to get the herd down to a safe size for the land. Game managers will often increase the length of the hunting season and increase the bag limit.

The gun thus plays a definite part in conservation. It harvests much game that would otherwise be lost to natural causes. It can help nature bring an overlarge herd down to a safe size. With few exceptions, hunting alone has relatively little effect on overall game population. Whether hunting is allowed or not, whether seasons are long or short, whether females are to be taken or not; the game population remains about the same on the average.

The real problem for game animals is what man has done and is doing to the habitat in which these animals live. Replacing woods, fields, and marshes with subdivisions, shopping centers, superhighways, industrial complexes or airports, leads to reduced numbers of game animals. Pollution of soil,

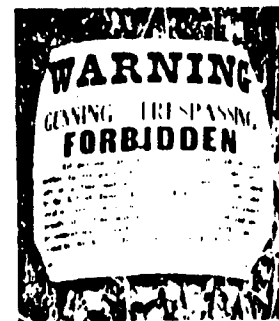
water, and air and the careless use of some chemicals is also harmful to wildlife.

## Hunting Regulations

1e Explain the main points of the hunting laws in your state. Tell the kinds of game which may be hunted. Give any special laws on the use of guns.

Each State has its own hunting regulations. They are usually issued by the State fish and game department, conservation department, or the similar organization which controls hunting and fishing. You can obtain copies of the regulations by writing the correct department at your State capital. You usually can obtain the regulations by visiting the local sporting-goods store or hardware store where hunting licenses are sold. Your merit badge counselor can help you.

Federal regulations cover migratory birds such as ducks, and





you need a federal duck stamp to hunt them.

There are many differences in the State game laws, due to differences in geography, population, history, and game types. Even within the bounds of a single State, you may find that certain areas or counties may have different regulations, again varying because of local conditions.

The term "big game" usually includes deer, bear, antelope, elk, and moose; but, of course, all States don't have all those animals. Small game usually includes rabbits, raccoons, opossums, squirrels, and the like. Game birds include quail, doves, ducks, grouse, turkeys, prairie chickens, pheasants, etc.

Some types of wildlife are considered undesirable, and there are no regulations on hunting them in many states. Included are such creatures as the crow,

the fox, the ground squirrel, and the groundhog or woodchuck.

While most game birds and animals do not travel far from where they were born, ducks, geese, doves, and a few other species travel hundreds or thousands of miles. Consequently, State regulations are rather ineffective in controlling the harvest of this game. In fact, it is not possible to control it even within the United States; the birds travel so far. Therefore, Mexico, the United States, and Canada are cooperating to control the hunting of these migratory game birds.

As we discussed earlier, game is a crop which may be harvested each year. Game regulations are designed to harvest as much of the crop as possible without seriously effecting the harvest in the following years. The game regulations, consequently, will vary from time to time as drought, food, animal birth rate, and other factors affect the game.

Many States have regulations regarding the use or carrying of guns when hunting. These regulations are designed to protect you and others in the neighborhood. Such laws might prohibit carrying a loaded gun in a car or shooting from a car or near a building. Many States attempt to make the most of the game crop and to reduce needless wounding of big game by forbid-

ding the use of certain weak cartridges. These relatively ineffective cartridges may be singled out by name, by bullet weight, by striking energy, or by size. Pistols and revolvers of any kind or size are often prohibited for hunting big game.

Generally, all States require hunters to carry a license. Licensing is used to control the game harvest and to provide funds for further development and game management. To get a hunting license for the first time, in many States it is necessary for the prospective hunter to complete successfully the "Hunter Safety Course" developed by the National Rifle Association and given by NRA volunteer instructors. Even if your State does not require this, it is certainly worth your time to take it before you start hunting. You will find it interesting and if you have earned this Rifle and Shotgun Shooting merit badge, you won't find it too difficult.

### The Good Sportsman

**If Explain how a good sportsman acts when handling guns.**

The true sportsman follows one basic principle: Be considerate of others and treat them as you wish them to treat you.

This means that:

First, the sportsman knows and always follows the rules for

safe gun handling at home, on the range, and in the field. The sportsman knows and strictly follows the laws regarding possession and use of firearms. The sportsman knows and strictly follows the rules and regulations of competitive shooting. The sportsman knows and strictly follows the letter and spirit of the hunting regulations.

The sportsman is considerate of the landowner whose property he may be using. He asks permission to hunt on the property. He leaves gates as he finds them. He is careful not to damage fences or other property. He does not litter the area with trash.

The sportsman gets the most pleasure out of the hunting, seeing and getting within range of the game, rather than the actual taking of the game.

The sportsman is careful of his target, not only for safety but to avoid wanton destruction. He does not shoot powerline insulators, pipeline valves, signs, and similar property. He confines his shots to proper targets.

The sportsman is careful of the area beyond his target to ensure that the bullets that miss the target or ricochet don't travel on to cause damage.

The sportsman, when hunting in the field, gives the other fellow the first chance at game.

The sportsman does not take unfair advantage of another shooter in any way.



# Use of the Rifle and Shotgun

2a Describe two main differences between the rifle and the shotgun. Explain how these differences affect their use in the field.

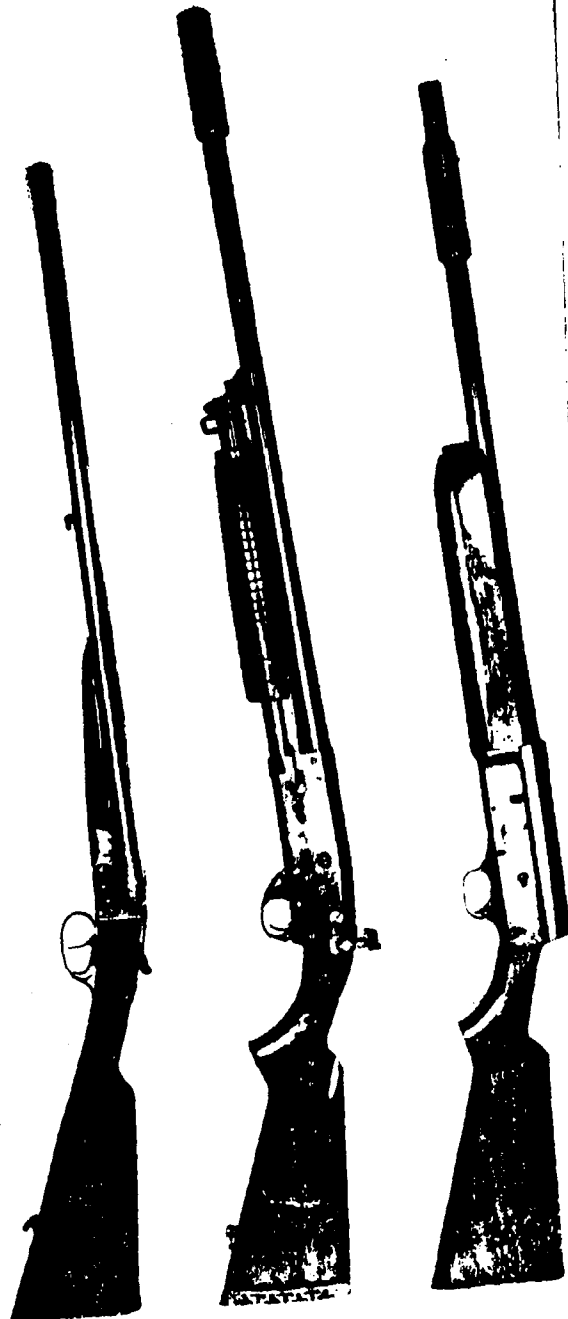
Three different kinds of high-power rifles: at left, a carbine-type bolt action; next, the Army's M1 military rifle; at right, a bolt action match rifle, designed for target shooting.

Four different kinds of rifles are shown on page 15: from left, a bolt action hunting rifle; a .22-caliber slide-action plinking gun, a lever action high-power rifle and an autoloading high-power rifle.



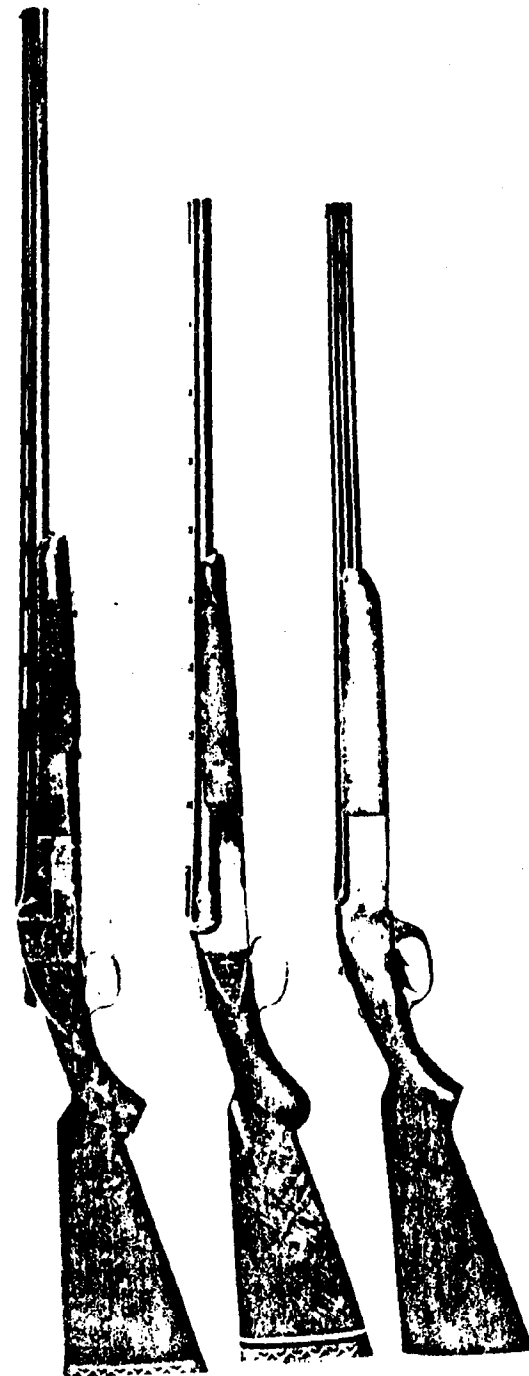
Three types of shotguns: the double-barreled, the pump, and the autoloader. The two on the right have muzzle devices for controlling choke and recoil.

16



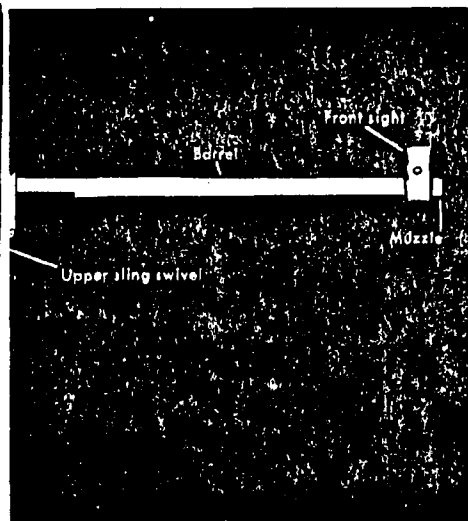
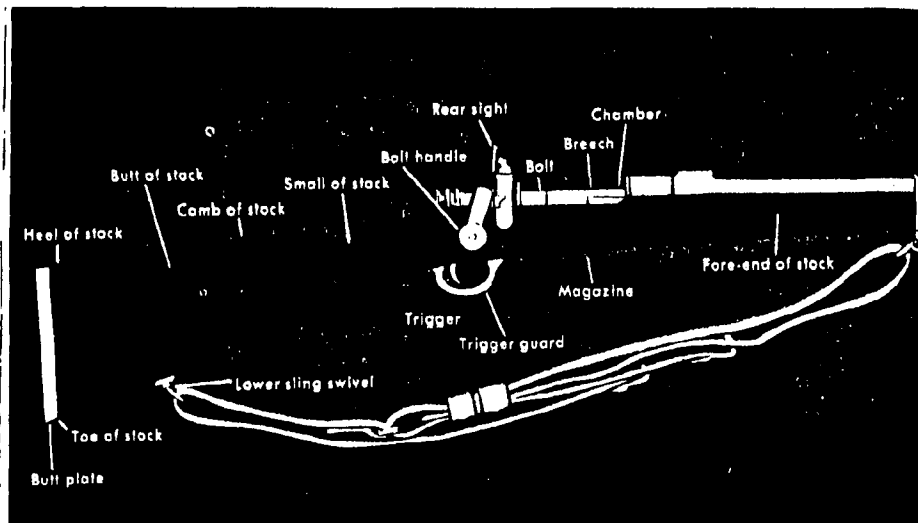
On the left, a single-barreled shotgun, specially designed for trapshooting; a fine double-barreled gun, useful for all kinds of shooting; and a .410 gauge under - and - over double-barreled gun.

17





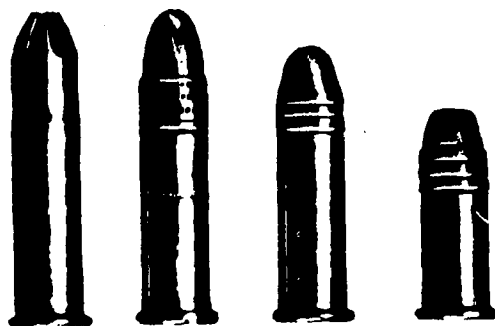
Spiraling gives the bullet stability in flight, like a top, plus greater accuracy and range.



The rifle is a precise instrument, designed for precision work. It is designed to hit almost exactly where you want to hit.

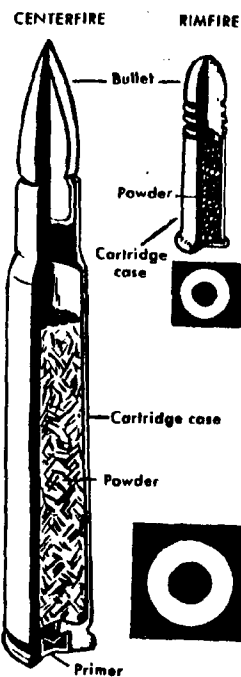
The rifle shoots a single projectile, which is both effective and accurate at long range. As this single projectile or bullet is forced through the barrel, it engages the rifling on the inside of the barrel. The rifling is like the thread on the inside of a nut, but stretched out. The rifling forces the bullet to spin, and when it leaves the muzzle, it is spinning rapidly like a well-thrown football. Like the football, the bullet flies nose first and straight, due to the spin and velocity.





The .22 shot cartridge, on the left, is about the same size as the .22 long rifle. It is larger than the .22 long and short and is used in shooting clay targets.

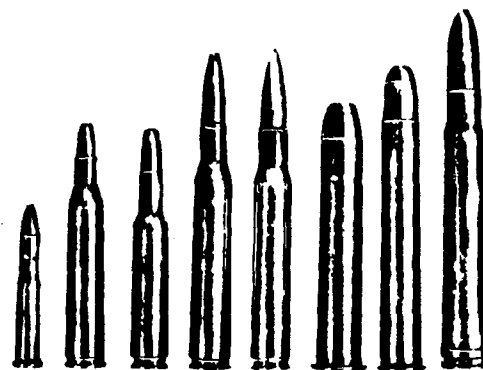
Rifle bullets may be made completely of lead, and the .22 rim-fire cartridge, which you may use for shooting your qualifying scores, uses a lead bullet. Bullets designed for higher speed, as used in the bigger hunting rifles, have a stiff jacket made of a copper alloy with a lead core. The jacket may be solid for use in target shooting, or it may have an open point or other modification to make it expand properly in hunting. In a given rifle,



The rimfire cartridge has priming all around the bulging rim. The firing pin hits this rim to fire the cartridge. All modern high-power rifle cartridges are of the center-fire type.

bullet weight can vary to some extent. The bullet speed or velocity will vary with bullet weight, the lighter bullet having the higher muzzle velocity.

Rifle cartridges come in a bewildering variety of sizes and shapes. Caliber will vary from about .22 caliber (less than  $\frac{1}{4}$  inch in diameter) up to .50 caliber ( $\frac{1}{2}$  inch in diameter); bullet weight from about 30 grains to 500 grains (7,000 grains to the pound); and muzzle velocity



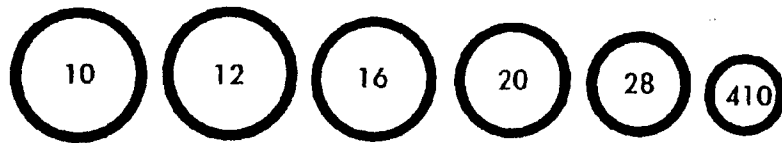
Center-fire rifle cartridges come in a tremendous variety of sizes and shapes.

from 1,100 to 4,100 feet per second (750 to 2,800 miles per hour). There is a cartridge with bullet weight and velocity suitable for almost any purpose—from shooting targets at 50 feet to shooting targets at 1,000 yards and from shooting squirrels to shooting lions.

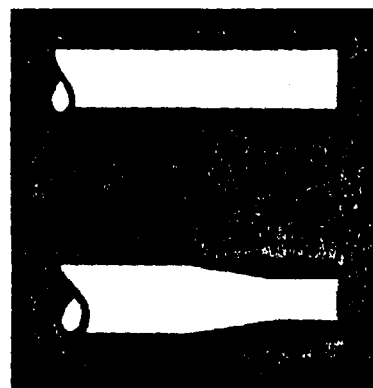
The most popular rifle cartridge in the world is the .22 rimfire, which comes in three kinds, the .22 short, the .22 long, and the .22 long rifle. The .22

short is somewhat less powerful than the others, and is good for shooting on an indoor range or whenever less power is needed. The .22 long rifle is the most powerful and is most used for outdoor target shooting and hunting. You may do your qualification shooting with a .22 rifle.

While any cartridge is dangerous if carelessly used, the .22 rimfire is perhaps more dangerous than most cartridges, since it is small and looks rather harm-



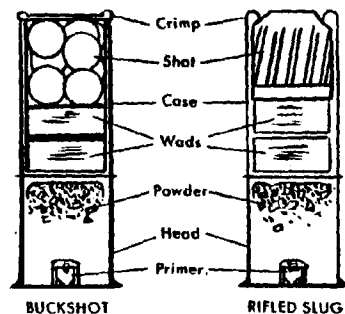
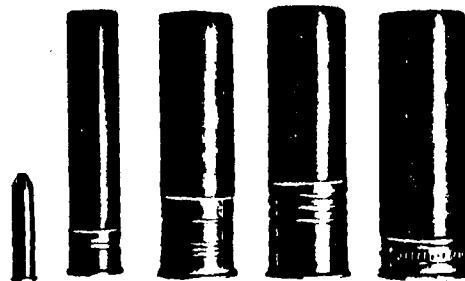
The larger the number, the smaller the bore in a shotgun.



Choice of proper choke, as illustrated, for the target and range results in a good, wide spread of shot, as shown on the left. A choke that is too tight for the conditions will certainly put the bird down; but the pattern is too small, and you can't take advantage of a real shotgun pattern.

The .22 shot cartridge, on the left, looks pretty small compared with the .410 bore, the 20 gauge, 16 gauge, and 12 gauge shotgun shells. This .22 cartridge is not a hunting cartridge.

These shotgun loads are used in big game hunting.



less. But the .22 bullet will travel a mile and still be dangerous. Other rifle bullets have a longer danger range—up to 2 or 3 miles.

The real difference between a rifle and a shotgun lies in the inside of the barrel. Where the rifle bore has spiral rifling cut in it, the shotgun has a smoothbore. Instead of shooting a single projectile accurately to long range as does the rifle, the shotgun shoots a large number of small projectiles in a scatter-gun pattern, usable only at short range.

The shotgun like the rifle is a precise instrument, but it is not made for precision work, as is the rifle. The small projectiles, which are round lead shot, cover an area but are not effective at long range. With the usual shot loads, the effective range of a shotgun is always under 100 yards, and usually under 50 yards, since the shot loses velocity very quickly. However, the shot pattern can effectively cover an area 3 or 4 feet in diameter.

Unlike that of the rifle, the

## SHOTGUN FIRING SEQUENCE

Firing Pin Strikes Primer.

Primer Explodes.

Powder Is Ignited.

Burning Powder Forms Gases.

Expanding Hot Gases Propel Shot.



muzzle velocity of shotguns does not vary much, ranging from about 1,150 feet per second to 1,350 feet per second. Total weight of the shot charge varies somewhat, from 1 ounce to 1½ ounces in the 12-gauge, for example, and the lighter load usually has lower velocity. The important variable with a shotgun is the shot size, ranging from the tiny No. 9 (nearly 10,000 to a pound) to the big buckshot (100 to the pound) and even to the specialized single slug (16 to the pound) used for deer hunting. For long range or bigger game, large pellets are used, but only a few can be put in a shotgun shell. For shorter range or smaller targets, a large number of smaller pellets can be loaded. Again, unlike the rifle, there are

only a few calibers of shotguns, the most popular being the small .410 bore (about ¾ inch in diameter), 20 gauge, 16 gauge, and the big 12 gauge (about ¾ inch in diameter). The main difference between these lies in the heaviest shot load each can shoot, and not in the pattern size. The smaller gun is usually lighter, however.

The inside of the barrel will show one other difference between the shotgun and the rifle. The rifle barrel is a straight, cylindrical tube for the full length ahead of the chamber. The shotgun barrel is usually a bit smaller at the muzzle or is "choked." The choke gives a considerable amount of control on the spread of the shot, so that you can get a good 40- or 50-yard pattern of shot with "full choke"; or a more

open pattern, good at shorter ranges, with less choke.

There are a couple of exceptions which may confuse you. We mentioned one earlier—the single slug in the shotgun. This is used for short-range deer hunting but has less velocity and shorter range than most deer rifle cartridges. It does make the smooth-bore more usable, but the single slug calls for the same sights and shooting technique as the rifle. The other exception is the .22 shotgun. This is a .22-caliber gun with no rifling—a smooth-bore. It shoots a special .22-caliber cartridge, loaded with shot, designed to break the small clay birds. This is not an effective hunting cartridge, but you may earn your shotgun qualification with it.



## Sighting a Rifle and Shotgun

2b Draw and explain proper sight alignment and a proper sight picture with the rifle and the shotgun. Explain how these differences affect their use in the field.

Sights are put on a rifle for two purposes, and you should be careful not to confuse the two. The primary purpose is so that you can point the rifle at exactly the same spot each time—line up the rifle exactly on the target. This will result in your shotholes on the target being very closely grouped together—a “tight group.” The first and most difficult thing for you to learn is how to shoot a tight group. Nearly all your effort in learning to shoot the rifle is devoted to learning how to do precise work with this fine instrument.

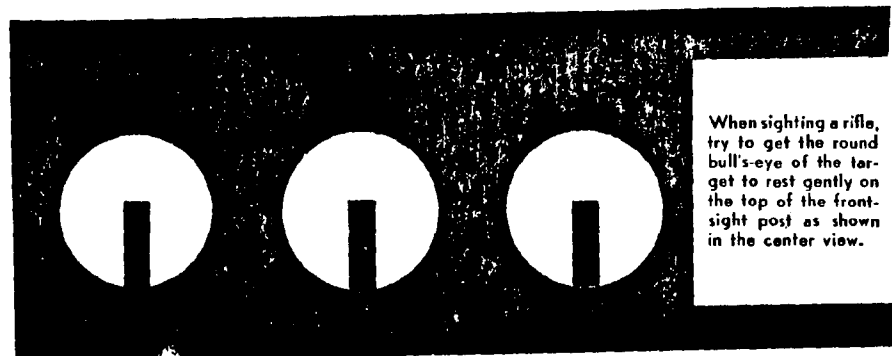
The second purpose of rifle sights is far less important and is learned fairly easily. This second purpose is to put the center of your group on the center of the target, which will give you the highest score and the best chance of hitting right in the center. Rifle sights can be moved

sideways and up and down to allow for changes in wind, distance, light, and other factors.

The first purpose of the sights—ensuring exact, precise alignment—is called “sighting” or “sight alignment.” The second purpose of the sights—the mechanical movement to center the group on the center of the target—is called “sight setting.” Sights are usually set by turning knobs, and usually there are graduations on the sight so they can be carefully adjusted and the setting can be recorded.

If you want to hit the target in the center consistently, you must shoot a small group and you must have the right sight setting. Since shooting a small group is the difficult job, and sighting is a big part of it, let's talk about sighting, sight alignment, and sight picture first.

There are various methods of

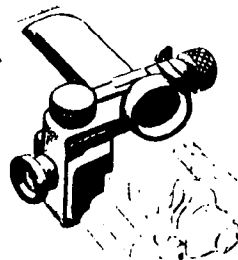
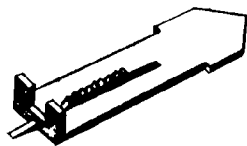


laying up the sights, and almost any method will be OK if it is used consistently. However, over the years the world's best shooters have determined that certain methods are the best for target shooting. We will talk mostly about peep sights, as these are practically always used in target shooting and very extensively in hunting.

There are three parts to the sighting system: the rear sight, the front sight, and the target. The rear sight is a small hole in a metal disk. The size of the disk is not important and the size of the hole in the disk is not important, as long as it is big enough. Take a good look at that peep sight now—this is probably the last time you will look at it. You look through the peep sight, not at it. Get your eye as close to the disk as you can and you will then see through the hole



Generally, you are better off to shoot with both eyes open when using the shotgun. Instead of looking at the sights, as you do with the rifle, you concentrate on the target. But if your left eye (for a right-hander) is your “master” eye, you may have to shoot a shotgun with the left eye closed.



The micrometer type rear peep sight is used for nearly all competitive target shooting and is widely used for hunting.



Rear peep



Rear peep



Rear open



Post front sight



Aperture front sight



Post front sight



Proper alignment



Proper alignment



Proper alignment



Proper sight picture



Proper sight picture



Proper sight picture

Here's how the sights should look when using a peep rear and post front, a peep rear and aperture front, and an open rear sight and post front.

with a black blur all around.

The front sight is a short metal post with a flat top and straight sides. You look *through* the rear peep at the front sight. Center the top of the front sight in the rear peep, concentrating on looking at the post. This is proper sight alignment and you should practice this until it becomes second nature.

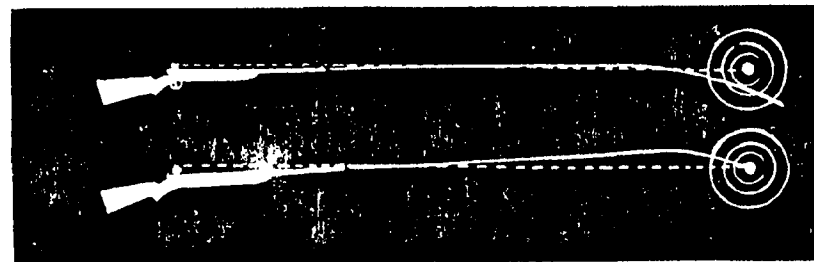
The third part of the sighting system, perhaps surprising to you, is the least important of all—the target. With the front sight centered in the peep, try to get the round bull's-eye of the target sitting gently on top of the post. If you look hard at the bull, the front sight may be a bit fuzzy, and if you look hard at the sight, the bull may be a bit fuzzy. If you are lucky, they will both seem sharp. But whatever you do, be sure the front sight is sharp and clear, no matter how fuzzy the bull may be.

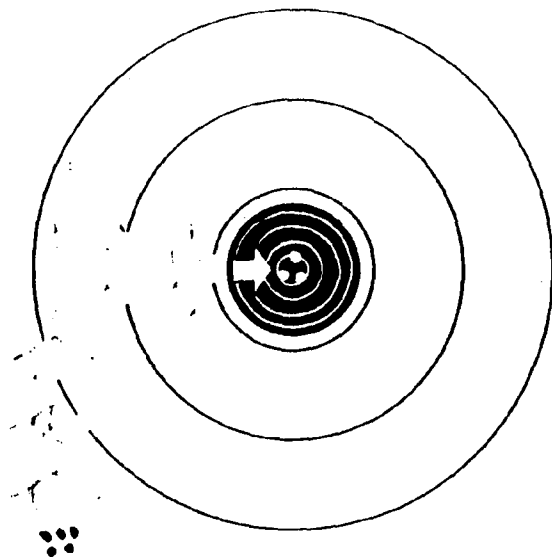
If all goes well, the bull will

sit quietly there on top of the front sight, waiting for you to shoot it. But usually the bull will appear to be bouncing and dancing around, never holding still for a moment. Don't worry about this, it happens to all of us. Keep concentrating on your sight picture. Later we will discuss how to shoot this skittery target.

Even you can put all your shots through the same hole, you won't be very effective unless you can center them on the target, and this is why sights (usually the rear sight only) are adjustable. A bullet starts to fall away from the line of the rifle barrel as soon as it leaves the muzzle. If you are going to throw to home plate from the outfield, you have to throw the ball high in the air in order to reach it. In the same way, to reach a distant target with a bullet, the rifle barrel must be pointed up in the air, a different amount for each distance. As we change range, it is

Rifle sights are made adjustable to make allowance for bullet fall or trajectory, which is different for every distance.

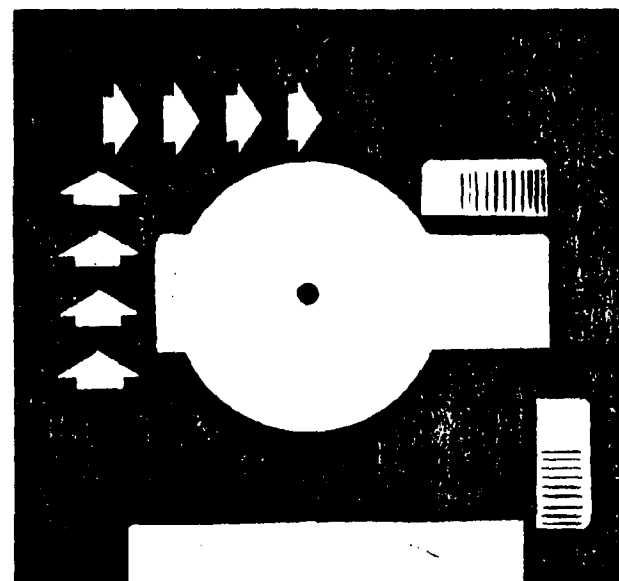




If you want your group on the bull's-eye, move the rear sight up and right.

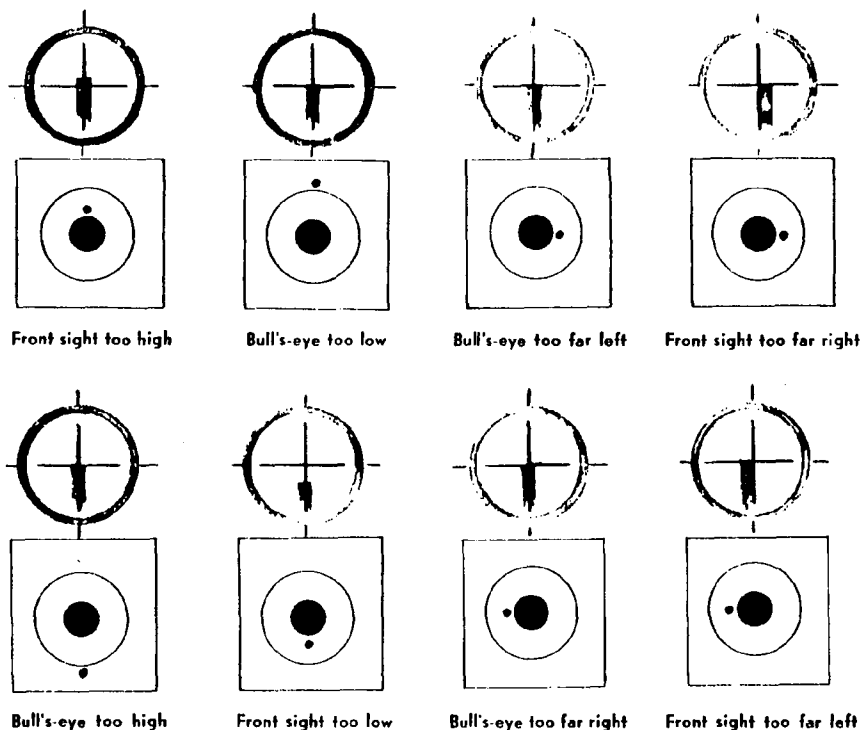
necessary to change the "elevation" by moving the rear sight up or down. The rear sight can usually be moved sideways, too, to make allowance for crosswind and for differences in shooters. In order to shoot good groups, you must use the right sight alignment on every shot. In order to hit center, you must

Move the rear sight in the direction that the hits on the target should move.



move the rear sight sideways or vertically until your group is neatly centered around or in the bull. You move the rear sight in the direction you want to move the bullet hole. Besides the peep rear sight and post front sight, there are other kinds of sights used on rifles which we should look at hastily. The "aperture"

front sight is a disk with a round hole in it. When using the aperture front sight, you have three circles -- the round hole in the rear peep sight, the round hole or aperture in the front sight, and the round bull's-eye. You get these three round things all lined up, with the front aperture centered in the rear peep as

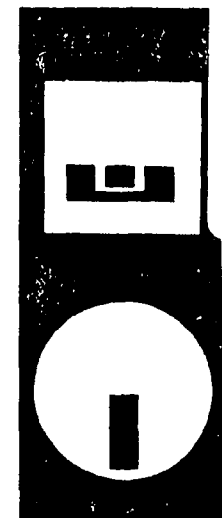


the first step, and then the round bull's-eye centered in the front sight aperture. At least you try to keep the bull centered in the aperture as best you can. Once again you concentrate on lining up the front sight.

Some rifles may have a rear sight which is a U or notch in a plate, usually mounted on the

barrel. With this sight you center the front post in the notch and have the top of the post just even with the top of the rear sight. With this open sight, you must look at the rear as well as the front sight and the target. The open sight is not as accurate or as easy to use or effective as the peep sight.

The "clock" system is used to give direction on the range. The direction you are shooting is 12 o'clock, to the right is 3 o'clock, while 6 o'clock is behind you and 9 o'clock is on your left.



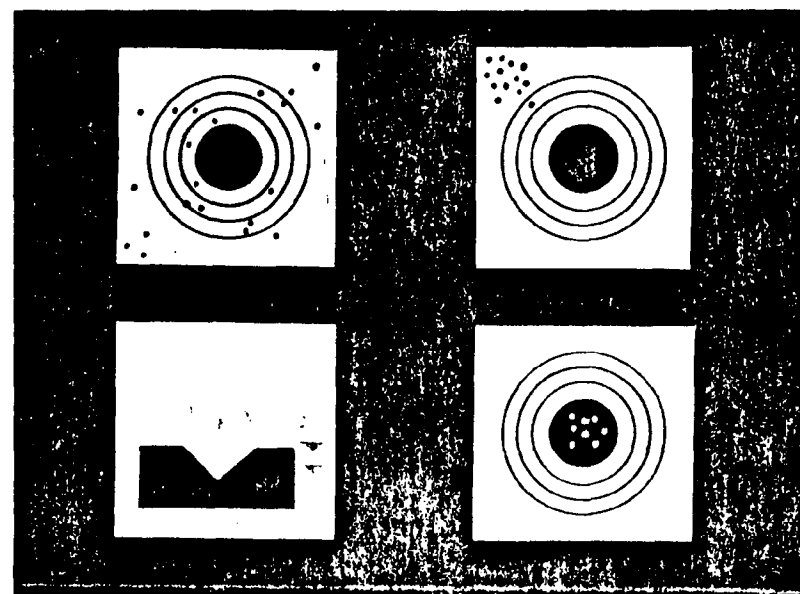
Top left. A big, scattered group, centered on the bull. This shooter needs more practice on sighting, position, and trigger squeeze. No sight setting or sight adjustment will help.

Top right. This is a good group and the shooter should be proud of it.

Bottom right. To get the highest score on the target, the group should be centered on the bull.

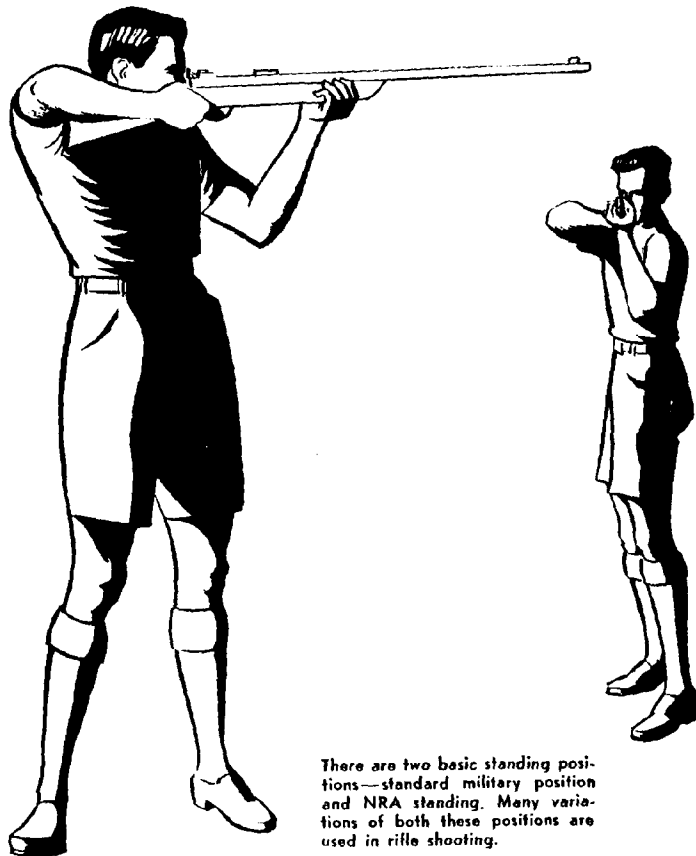
Bottom left. To center the group on the bull, the sights should be moved right and down.

When using the open sight, the front-sight post should be centered in the notch with the top of the front sight even with the sides of the notch. When using the peep sight, the top of the front-sight post is centered in the rear peep sight.



## Rifle Shooting Positions

2c Explain the principles of good rifle shooting positions. Show three positions. Explain and show the differences between a good rifle shooting position and a good shotgun shooting position.



There are two basic standing positions—standard military position and NRA standing. Many variations of both these positions are used in rifle shooting.



*In the standing position, the shooter should stand facing almost at right angles to the target, with feet spread apart and knees straight but relaxed. The forearm of the stock rests in the palm of the left hand and the left hand lightly grasps the forearm. The elbow is directly under the gun. The left arm should not touch the body.*

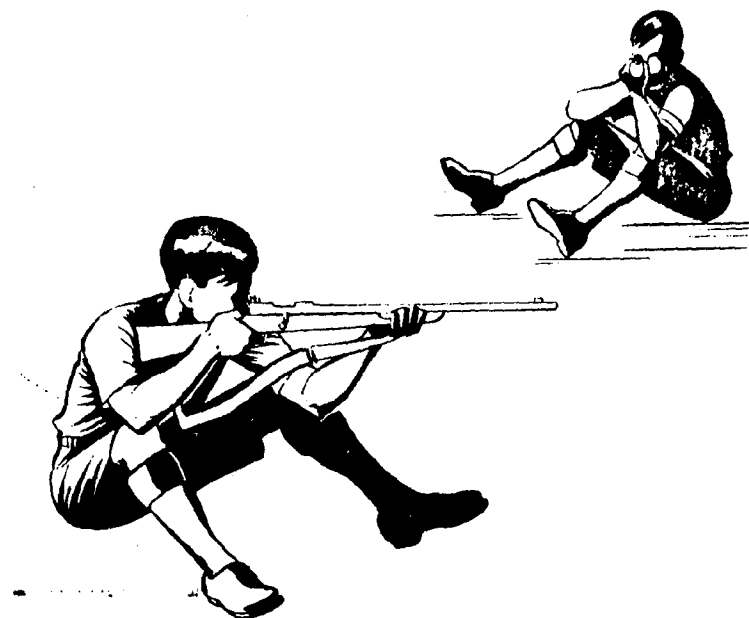
*For the NRA standing position, the shooter's left hand is allowed to slide back toward the trigger guard, and the gun rests on the*

thumb and fingers which form an inverted tripod. The upper left arm is against the body and the elbow is supported by the shooter's hip.

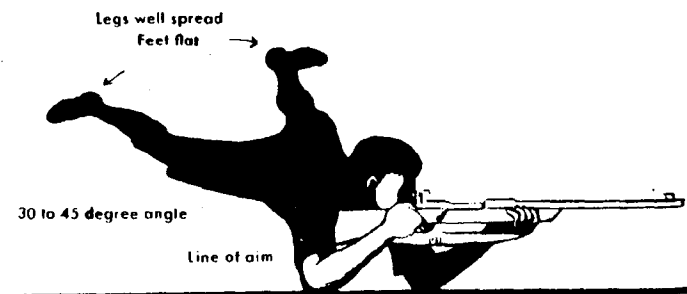
As we have seen, rifle shooting is a precision sport. The foundation is a solid, steady position. The general rule in rifle shooting is to use as few muscles as possible and to use them as little as possible. Instead of using muscles, which get tired and shaky, use your bones as much as you can to support the rifle.



*In the sitting position, again your left elbow should be directly under the rifle and it should rest firmly on the left knee or leg. The weight of the right elbow is taken by the right knee. Shift your position around until the rifle points easily and naturally at the target. Your legs should be crossed or spread wide apart, at your choice, as long as you get the most comfortable, relaxed, steady position.*







*In the prone position*, for example, you lie down facing the target, with your body at an angle to the line of fire. The rifle is against your right shoulder and your right hand holds the grip. Most of the rifle weight is taken by the left arm. If you put your left arm directly under the

rifle and let the rifle lie flat in the palm of your hand, you are taking best advantage of your bone structure. The weight of the rifle is taken by the hand and wrist and transferred to the arm bones, ending up with your elbow solidly on the ground.

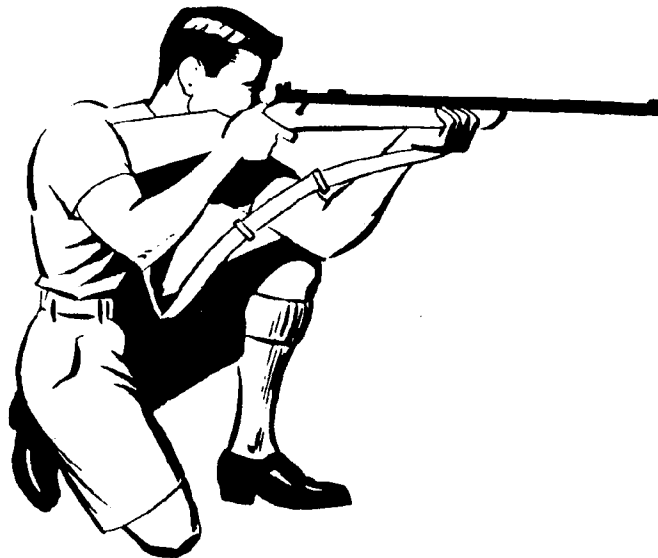
Carrying this one step further, your feet should be turned out and lying flat on the ground, rather than resting on the toes—but don't force the position. Close your eyes for a moment and relax everything as much as you can. Open your eyes and glance through the sights. If the rifle isn't pointing at the target, shift your position slightly right or left, backward or forward while keeping your left elbow in position. You should be able to get the rifle pointing naturally at the target without any muscular strain. Let the bones do the work—no muscles!





for your right elbow, but it has been found best to keep it high, rather than letting it hang down. By keeping it high, you make a pocket for the butt of the rifle.

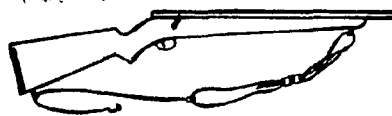
The rifle sling or strap is often used to help support the rifle and to hold it steady. The sling is fastened to the forearm of the rifle. A loop is put around the upper part of the left arm (for a right-handed shooter), and the strap passes smoothly across the wrist to the forearm fastening. The strap should be fairly tight, and it will relieve your left hand of the job of grasping the rifle. The left hand merely lies flat and



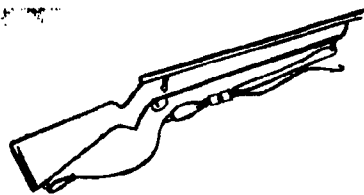
*In kneeling*, again let the left arm and left leg carry the rifle weight. Sit on the side of your foot, if you can; or sit on your heel, if you must. There will be no support for your right elbow, so you will have to let it hang wherever is convenient and most comfortable for you.

As you move the rifle further away from the ground it gets less support and the position becomes less steady, with the standing position being the most wobbly. In the standing position, your left elbow will get only as much support as you can give it by resting it against your hip or chest. There will be no support

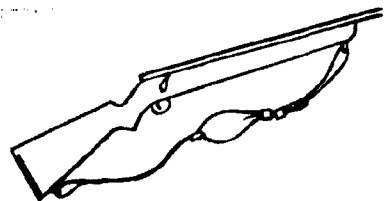




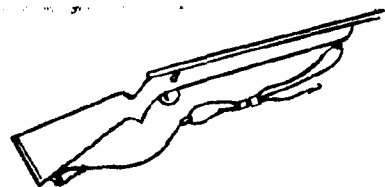
1. The hook on the short end is disengaged and rehooked in one of the holes in the short end.



2. The top hook is released and the arm loop drawn down to about the trigger guard.

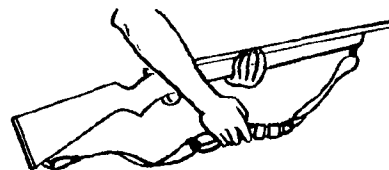


3. The top hook is reengaged a few holes from the end of the long strap.

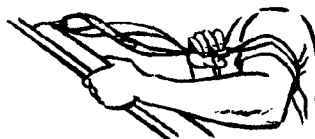


4. The leather bands are moved toward the upper swivel.

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5. The sling is given a half-turn, counter-clockwise with the right hand.



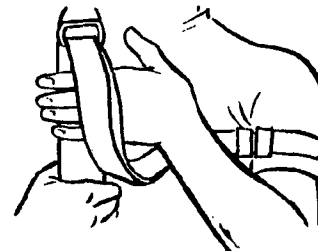
6. The left arm is thrust through the loop at the lower end of the top strap until it is well up close to the shoulder.



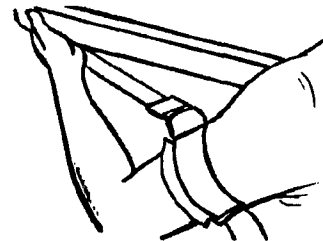
7. The leather bands are pulled down snug against the arm to hold the loop in place.

acts as a platform. The sling is a very big help in the prone, sitting, and kneeling positions, but is of much less help in the standing position. The other end of the sling may be fastened to the butt stock of the rifle, and it then becomes very useful and helpful as a carrying strap.

The shotgun does not have a sling, since the one thing you



8. The left hand is swung over the sling and then placed on the forearm of the rifle inside the sling.



9. The sling lies flat against the back of the hand.

don't want with a shotgun is a steady, immovable position.

### Shotgun Positions

Although the shotgun is used only in the standing position, this is not much like the rifle standing position. Where the rifle position is easy, relaxed, solid, and steady, with the shotgun you need to be slightly tensed, ready to move quickly in any direction. The left arm

should reach out on the forestock so that you have good control and so that the left arm is clear of your body. Weight should be slightly on the forward left foot, and you should lean forward slightly to permit easy swinging and to permit a quick recovery from the recoil of the shotgun in case it is necessary to put in a fast second shot.

You face much more toward the target than you do with the rifle, so that you can easily move in any direction. For a right-hander it is easier to swing far to the left than it is to swing far to the right. So your foot position has to allow for this, when possible. The feet should be spread a bit, with the left foot pointed more or less at the spot where you expect to shoot, whereas in rifle shooting both feet are pointed at right angles to your line of fire. Weight is slightly more on the left foot. Shotgun swing comes from the ankles all the way up. Your whole position is based on this.

Incidentally, we have talked about the right-handed shooter all the way through this book. This is not to say that the left-handed person can't be a good shot. There are many outstanding left-handed shooters. To simplify this, we have talked only about shooting from the right side. A left-hander just has to change "right" to "left" in the text and he is in business.

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Since we saw that the shotgun fires a spread pattern of small pellets so that we can hit a moving target, you will not be surprised to find that it does not have fine, precise sights, as does the rifle. In fact, many shotguns don't have any sights at all. At the most, there will be a small bead on top of the barrel at the muzzle and another about half-way down the barrel. But these are merely for checking and are not used in shooting.

The shotgun is not carefully aimed like the rifle but is pointed, much as you point your finger. The muzzle of the gun acts as your front sight, and your face on the stock acts as the rear sight. And just as with the rifle, if you change the rear sight—the position of your face on the stock—you will change where you hit. Consequently, it is necessary to put your face on the stock exactly the same way each time. This is one of the keys to good shotgun shooting!

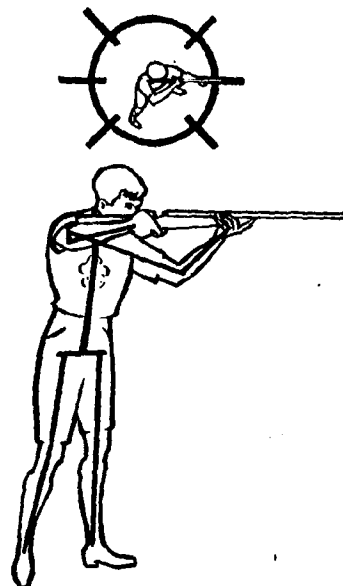
When shooting the rifle, you aim directly at the target each shot and you adjust the sights as necessary until you hit center. When shooting the shotgun, however, you rarely aim directly at the target and you never change your "sight setting"—the position of your head on the stock.

In order to hit a moving target with the shotgun, you must lead it, just as you must lead a

running pass receiver with a football. You know from experience about how fast the receiver can run and how long it will take the football to get out there. So you throw the ball well ahead of the runner, expecting ball and receiver to arrive at the same place at the same time. Shotgun shooting uses the same technique. Nearly any moving target takes some lead, since it takes the shot charge a considerable time to get from the gun to the target.

It will take some practice for you to get the feel of proper leads; but the more you shoot, the better you will become at estimating the right leads for targets coming from any direction. Leads may be as much as several feet for a crossing target or as little as nothing for a target going directly away from you. The lead has to be applied in the direction the target is flying relative to you. A safe rule is to always be ahead of the target. If it is moving to the right, be to the right of it. If it is coming overhead, be out in front of it. If it starts low and is climbing away from you, hold above it.

There is another major difference between sighting with the shotgun and the rifle. With the rifle you concentrate on the front sight, while with the shotgun you concentrate on the target. You make an estimate of the size of the target, its distance from



The shotgun shooter must be ready to swing in any direction—right, left, up or down. He should be slightly braced to recover from the recoil and fire a quick second shot if that should be needed.

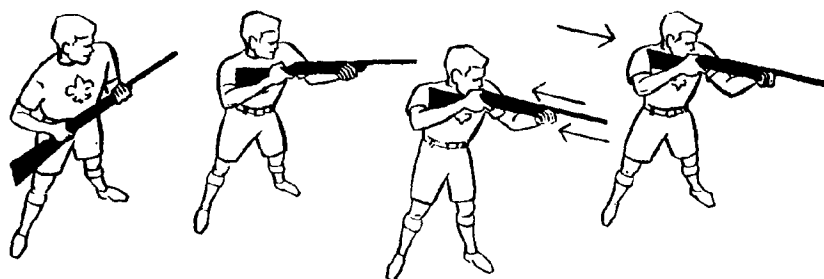


you, the direction it is flying, and its speed. You feed these things to your built-in computer and it gives you the answer as to direction of lead, amount of lead, and when to shoot. The important thing is to concentrate on the target. You will see the muzzle of the shotgun as a gray blur, not in sharp focus.

There is still another major difference between sighting with the rifle and sighting with the shotgun. In rifle shooting you normally use only one eye—the right eye in the case of a right-handed shooter. The left eye doesn't do any work and usually is closed so it won't confuse the sharp picture we want to get with the right eye. In shotgun shooting, on the other hand, it is best to use both eyes. We are shooting at a target which is constantly moving, and we can get a more accurate estimate of range and speed with both eyes

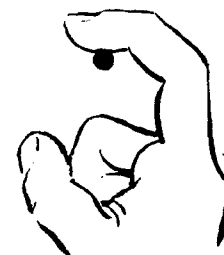
open. It's desirable to shoot with both eyes open if you can.

There is an exception, however, and that is if your left eye (for a right-handed shooter) is your "master" eye. Bring your arm up and point your finger at a distant object. Close one eye, open it, and close the other. When you are looking with one of your eyes, your finger will appear to be still; but when you look with the other eye, your finger will appear to jump sideways. If your finger stays put when you look with the right eye but jumps when you look with the left, your right eye is the master eye. This is normally the case with right-handed people. If you are left-handed, the reverse is true. But if you are right-handed with a left master eye, you will be better off to shoot with the left eye closed (or vice versa). For more help, see pages 27 and 49-51.



## The Trigger

2d Explain and show the right use of the trigger in rifle shooting. Explain and show the right use of the trigger in shotgun shooting.



When shooting either the rifle or the shotgun, it is necessary to pull the trigger to release the firing mechanism without disturbing the gun. In the larger calibers, the gun makes considerable noise and may kick you a bit. The common reaction is to tighten up just before the trigger is pulled to resist the kick and noise. This leads to jerking the trigger, with resultant wide shots and unaccountable misses. Although with both rifle and shotgun you want to release the firing mechanism without disturbing the gun, the details of how this is done differ between the two types of guns.

The differences come about through the nature of the weapon and the target. The rifle is nor-

mally fired at a stationary target, which means that there is plenty of time for the shot and there is no rush about pulling the trigger. With this precision instrument you try to put all your shots in the same hole. The slightest thing that interferes with this precision will reduce your score. The rifle trigger must be pulled with a rather slow, gradual increase in pressure by your trigger finger. You will find that the sights wobble around, and only occasionally will things be lined up just the way they should. The great temptation at that moment is to yank the trigger while things look good. This may give you a center shot—but more likely it will give you many wide ones. Don't yank it. Even if you don't yank the

shot, you may find that you have a tendency to grab the rifle with a grip of iron, in an attempt to hold it still and reduce the wobbles. This won't work either. The only thing that will help is a great deal of careful practice, which will gradually reduce the wobble area. But when you are starting out, you will have to accept your normal wobble. As long as the sights are properly lined up, forget about the wobble and concentrate on trigger squeeze.

This "wobble area" may be something new to you. We've mentioned it, but it is so important that we should look at it more carefully. As we saw, the rifle won't hold still when you put it in position. If you put a pencil on the end of the rifle barrel and lightly touched the target with it, after a few moments you would have a pattern of pencil lines zig-zagging back and forth, up and down across the face of the target. This is your wobble area and as long as your gun is pointed in this area, it is OK to put the pressure on the trigger. If you hold too long on any particular shot, however, you will get tired and your wobbles will become very great. In that case, take the rifle down, rest, and start all over again. Don't think you are alone with the wobbles—the champion has them too. But he has so trained himself through exercise, practice, and more practice that his wobble area is much

smaller. But he still has a wobble area and he still shoots as long as he is moving inside that area. If you want to become a champion—or just to improve your scores—practice will help you reduce your wobble area and to apply proper sight alignment to each shot. As you get more experience you will learn to squeeze the trigger gradually when the sights look good, hold this when they drift away, and apply more pressure when they look good again. In this way, the shot goes off only when the sights are lined up. This takes much practice.

Trigger operation with the shotgun follows the same principle of releasing the trigger smoothly without disturbing the gun. But it must be done very quickly. Since the shotgun is used on moving targets, you have only a few seconds when the target is within range, and, if you miss your chance—that's it.

The shotgun trigger must be pulled quickly and decisively in that fraction of a second when the bird is within range and when your swing and lead are just right. Just as with rifle shooting, it is important not to tighten up your shoulder or body muscles in anticipation of the noise and recoil, since this will move your gun unexpectedly. You don't tighten up with the trigger hand either, but you give the trigger a quick flick to the rear, sometimes called trigger "slap."

## Shotgun Swing

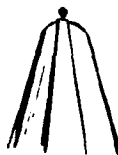
**2c Explain and show shotgun swing. Explain why "follow-through" is so important.**

We have already talked about the necessity for giving *lead* to a moving target. The shot charge from a shotgun will take well over 1/10th of a second to travel 40 yards. A target traveling across in front of you at 60 miles an hour would require over a lead of 9 feet. Fortunately, most targets don't travel quite that fast, but this gives you some idea of the importance of lead. The amount of lead, as we saw, varies with the range, the angle of flight of the target, and the target speed; you learn to compute lead quickly only by experience. The important point, again, is that you generally must lead almost every moving target.

There are various ways of getting this lead. An obvious way that you might think of would be to poke the gun muzzle ahead of the bird, stop the gun, and pull the trigger when the lead looks OK. You may occasionally hit a

bird using this method, but you'll be lucky if you do. This is the poorest method of shooting and you should avoid it.

A much more satisfactory method is to swing out ahead of the target by the amount of lead you estimate is correct and to keep swinging along as you pull the trigger. This eliminates any human reaction time and is a good method of shooting. But watch out! There is a very common tendency to quit swinging as soon as the shot is fired—and this often turns into a tendency to quit swinging just *before* the shot is fired. This always results in a miss, well behind the target. To avoid this common fault, keep on swinging while you get the shot off and follow-through—keep on swinging after the shot has been fired. Pretend you have a paintbrush on the end of the gun and that you are painting a streak for the target to run into.



Keep your gun swinging and paint a streak across the sky!



The third method of shooting is somewhat like the second except that the shooter swings much faster than the bird. He swings from behind the target up to the target and well out ahead in one smooth, fast swing. The shooter decides to pull the trigger just as his gun points at the target. But due to human reaction time, time for the cartridge to fire, etc., when the shot charge leaves the muzzle, the fast-swinging gun is pointing well ahead of the bird—thus giving the necessary lead to the target.

Both these good methods require you to swing your gun fast — at target speed or faster. In both methods you will fail if you stop your gun swing before the shot charge comes out. Follow-through means that you keep on swinging after the gun has fired. Follow-through is important to keep you from stopping the swing too soon.

Swing and keep swinging! Follow through! If you don't swing and follow through completely, you will usually shoot a distance behind the target.





# Safe Gun Handling

**3a Explain the general principles of safe handling of guns and ammunition.**

It would be easy to make up a list of safety rules for handling guns and ammunition that would fill this page — and many more pages. All these rules would undoubtedly be important and things you should know to guide you in handling firearms and ammunition. But you're not likely to remember all these rules, and since they all get back to three basic principles, we want you to learn these basic principles and how they are applied. If you remember and apply these few things, you will be a safe handler of guns and ammunition.

The first and most essential principle to remember is: *Treat every gun as if it were loaded and ready to go off!*

It doesn't really make much difference whether the gun is loaded or not and it doesn't really



make much difference whether the gun does discharge or not. As long as you are following this principle, you will have it pointed in a safe place and, while you may get an unpleasant surprise, no one will be hurt. Remember this basic principle and follow it every time you handle a gun.

You treat every gun as if it were loaded whether you are at home, on the range, or in the field. This means that you never let the gun point at you or anyone else. But, you may ask, what about the safety — doesn't that keep a gun from firing by accident? The answer is *no*, it does not! The safety is not to be relied on. In the first place it may be off when you think it's on. This frequently happens when you're in the field and getting a lot of exciting shooting. Besides, the safety is a mechanical device and is subject to failure. So keep the safety "on" whenever you can because it may add a little something additional, but certainly do not trust a safety.

When you're loading or unloading a gun, be especially careful, since a gun that is dirty, out of adjustment, or with a broken part sometimes will fire during this process even though you haven't touched the trigger. It's very easy to be careless with the gun muzzle when you're involved in loading or unloading a gun.

When you are hunting in the field with companions, you will

have to know where they are all the time. Of course you wouldn't shoot unless you knew it was safe in that direction. But you also have to keep track of your companions so your gun won't be pointed at them as you carry it. A branch or twig might catch on the trigger and fire it. It is easy to slip or trip and fall when you are concentrating on finding game. Carry your gun so that it won't be pointed at you or your companions if you fall. Guns have been known to go off from the shock of being dropped.

As long as you follow this first principle, you will be a safe gun handler. But there are obviously times when you cannot follow it exactly; for example, when you are cleaning a gun. So what do you do? There is one other basic principle which will cover practically all other cases when you must handle a gun.

This other principle is: *An open, empty gun is safe! Open the action, remove the magazine if possible or be sure it is empty, be sure the chamber is empty, and leave the action open.* As long as you keep the gun in this condition, it is safe. But the moment you close the action, you must treat the gun as if it were loaded and ready to fire.

With the action open and no ammunition in magazine or chamber, the gun cannot be fired. In fact, almost any time when you are not actually shooting,

open the action, take out the ammunition, and leave the gun open. This tells both you and your companions that your gun is safe.

*Every time* you pick up a closed gun you assume that it is loaded and act accordingly until you can clear it. We will mention this again later, but it is worth emphasizing—removing the magazine from a gun does not unload it! Removing the magazine does not take the cartridge out of the chamber. Open the action, check the chamber for ammunition, and leave the action open.

You may want to put your gun away in the cabinet or in a gun case with the action closed to protect the mechanism. Remember that as soon as the action is closed, you treat the gun as loaded. To put the gun away, closed in a case, once again examine the action to be sure it is empty. Point the muzzle in a safe direction, close the action, and pull the trigger. Then put the gun in the cabinet or case—treating it as a loaded gun.

If you handle guns long enough, you may very well have an unintentional discharge and it's a most frightening thing! You don't expect it, you know the gun is safe, but it certainly did go off—where did you have that muzzle pointed? Since you never know when this unintentional firing may happen, you must play it safe all the time.

The other thing that you should remember concerns ammunition. We can sum this up in a few words: *Ammunition is dangerous, don't play with it.*

The rifle or shotgun cartridge is a harmless appearing thing, and it is harmless when it is handled correctly. But it can also be very dangerous if it is handled incorrectly. The primer by itself and the powder by itself are both powerful and dangerous. When you combine the two you have a real opportunity for serious trouble. The primer, of course, is designed to be fired by a sharp blow, but it will also go off under heat. It's very unsafe to pound the primer with a rock or hammer, hit it with a nail, or throw it in a fire. Even a primer by itself is plenty dangerous and has more than enough power to put out an eye or give a very unpleasant flesh wound.

Factory-loaded cartridges are carefully designed, made, and inspected to be sure they're accurate and safe. A factory load is safe in a gun for which it was chambered if the gun is modern and in good condition. Some very old guns may not be safe with modern ammunition, and, of course, if the gun has been abused and not well taken care of, it might not be safe. Some factory loads may not seem to have much powder in them, and you may wonder why the cartridge case is not full of powder.

Over the years as better powders have been developed, smaller and smaller quantities are needed to give the necessary force. The factory load will have all the powder in it that is safe. *Don't ever add more or tamper.*

The cartridge case and a gun are very carefully designed to go together. There are many different calibers of cartridges so you must be very careful to use only the correct cartridge for your gun. If you use the wrong cartridge, the gun may blow up and seriously injure you. Be very sure; this is no place for experimenting with ammunition.

If you follow these three general principles of gun and ammunition handling, you are not likely to cause yourself or anyone else any harm. Just remember that the gun and ammunition are not playthings. As long as the gun action is closed, you treat it as a loaded gun. If the action is open and the chamber and magazine have been examined to make sure they are empty, then the gun can be handled with more freedom.

### Personal Protection

The discharge of any firearm creates a muzzle blast which has the capability of affecting hearing. Prolonged exposure to such noise levels can inflict permanent, uncorrectable hearing damage. A firearm that fires a bullet which

is transonic (more than 1140 feet per second) generates the characteristic sonic "boom" which because of its high frequency component is even more damaging to hearing.

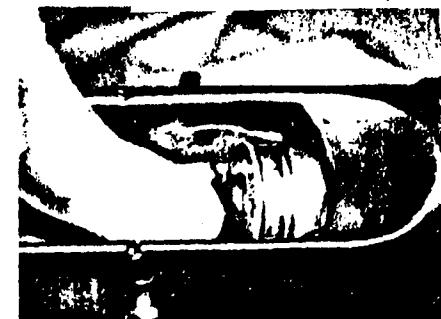
Even .22 caliber match bullets at times exceed the speed of sound at the muzzle, and this phenomenon is accompanied by the high whiplike crack which is sometimes heard in gallery ranges. Hearing damage, therefore, can result even from the .22 rimfire cartridge. The primary manner in which a shooter must protect his hearing is by the use of *effective* ear plugs or ear muffs. If ear plugs are used, they should be of the closed stopple variety. Ear plugs made of cotton balls are not very effective, and should not be used except when more efficient protection is not available.

Maximum possible protection is most easily achieved by muff type devices.

The person who wears glasses normally should always wear them when he goes into field. As a matter of fact, all shooters should wear glasses. They protect the eyes from gases and any debris that might be thrown back into the shooter's face when the gun is fired. They also can prevent painful and even disastrous eye injuries when twigs snap back into the hunter's face as he moves through brushy areas.

### Magazines

3b Explain the safety precautions for guns having fixed or detachable magazines. Tell the special precautions for tubular magazines.



With some tubular magazines it may be possible to take the shells out of the magazine without running them through the action. Always check the chamber!

In a repeating firearm, ammunition can be found in two places: the chamber and the magazine. Removing ammunition from one location does not remove it from the other. For the gun to be safe, ammunition must be removed both from the cham-

ber and the magazine. In some guns the whole magazine is designed to be readily removable, and when it comes out it brings its ammunition with it. But that still does not unload the chamber. Many people have been accidentally shot because they





Pull out the follower and look down the tubular magazine to see if it is empty.

thought that removing the magazine took out all the ammunition and made the gun safe. Until the chamber has also been proven to be empty, the gun is not safe. Some guns have a mechanism that keeps the trigger from being pulled when the magazine is removed. But this, like other mechanical safety devices, is merely an additional precaution and is not to be relied upon alone.

Magazines are generally of two types: the box type, in which cartridges lie one on top of another; and the tubular type, in which the cartridges lie end to end. You'll find both kinds in big and small rifles as well as in shotguns.

The box-type magazine is usually removable from .22-caliber rifles but may or may not be removable from other guns. In unloading a gun with a box magazine, the first step should be to remove the magazine if you can. Then open the action and carefully examine the chamber and the gun mechanism to be sure that a round has not been accidentally left in the receiver.

If the box magazine is not the removable type, open the action and examine the chamber and magazine for cartridges. If there are cartridges in the magazine, sometimes they can be removed by working them out with the fingers. In other cases, it may be necessary to close the action, at least partially, to get the round out of the magazine. Keep the muzzle pointed in a safe direction when doing this. When the last cartridge is out, double-check the magazine and chamber, and leave the action open.

The tubular magazine is a much more difficult thing to clear since it can't be removed from the gun and since, in most guns, it is very difficult to see into the magazine. In some shotguns the cartridges in the magazine can be removed without opening the action by pressing the cartridge stop with the fingers and letting the cartridges slip out one at a time. But when the magazine is empty, don't forget to open the action and clear the chamber.

In other guns, it's very difficult or impossible to clear the magazine except by working the action back and forth. This should be done with considerable care and attention to keeping the gun pointed in a safe direction.

Many .22 rifles with tubular magazines have a long inner magazine tube containing a spring and follower. The tube must be pulled part way out of the magazine to load the magazine. If it's convenient, it's a good idea to pull this tube clear out of the magazine and look down the magazine tube to make sure it's empty.

### Checking Actions

#### 3c Show how to check for safety the following:

Guns are made with a number of different kinds of actions. Each type of action is usually made by two or more makers. Not only do the basic actions differ, but different makes in the same kind of action vary in details. It is not possible to list here complete instructions on all the many different types. Describing in print how to clear a gun gets rather involved and lengthy. For the details, you should get the help of your merit badge counselor or an NRA-certified instructor.

The moment you are handed a gun, clear it and leave the action open. If you don't know how to open the action and clear the gun, you have to treat it as a loaded gun. Get it to someone who can clear it! When you are being handed a gun, move the gun or move yourself so that the gun doesn't point at you in the process. And when you are handing someone a gun after having cleared the gun, you hand it to him with the action open and the muzzle pointed in a safe direction. Hand it to him so he can easily take hold of it.

Incidentally, when we talk about "clearing" a gun, we mean that you open up the action and remove all the ammunition from the gun—both from the chamber and from the magazine. If the magazine is detachable, remove it and leave it out. It's good practice to take the ammunition out of a detachable magazine even after you have removed the magazine from the gun.

While it's a fine idea to keep the safety on whenever possible, this can occasionally be a bit of a problem. On some guns when the safety is on, it locks the action closed so that it can't be opened. In some cases, you can't put the safety to the "on" position unless the gun is cocked. If you are familiar with the gun, it is a good idea to put the safety on before you do any other handling of the gun.



This .22 autoloading rifle with the tubular magazine in the stock needs a "clearing block" to hold the action open and to show that the action is open.

### Semiautomatic Action

#### 3c (1) Rifle or shotgun (a) Semiautomatic action

The semiautomatic (or autoloading) action is a difficult action to make safe. In the first place, it has a magazine, with all the problems of getting the magazine out of the gun or the ammunition out of the magazine.

In the second place, the action is continually forced home by a strong recoil spring. You have to pull the action open against this spring and hold it open while you examine the mechanism to see that it is empty. The handle that you use to open the action may not be very large because of the possibility of its slipping out of your fingers. Under some conditions (as after a misfire) the gun may

fire when this happens. Pay special attention and be careful when clearing an autoloader!

On some guns, the bolt will automatically be latched open when the last round is fired or when the action is worked with an empty magazine in the gun. The autoloading shotgun with tubular magazine latches open like this. Guns with box magazines will often latch open on the last shot, but the latch is operated by the magazine, so if you remove the magazine the bolt is not latched open automatically. Sometimes there is a thumb lever you can use to latch the action open, while in other cases there is no way to hold the action open. In such cases it is a real good idea to use a clearing block. This is merely a small wooden block which fits inside the action and holds the breechblock open. The clearing block is used by the Army and in gun factories. Tack a couple of cloth streamers to the block so it is readily obvious that the action is blocked open.

Let's take a run through the procedure of making a semiautomatic action safe. The moment you pick up the gun, you apply our first safety principle and assume that it is loaded. So you immediately make sure the muzzle is pointed in a safe direction. If you know the action well and understand what goes on, you can put the safety to the "safe" position. If the gun has a detachable maga-

zine, remove it and lay it aside. Get a firm grip on the operating handle and pull it to the rear smartly until it stops. If the gun has been loaded, this should throw the loaded cartridge out of the action. While you hold the bolt open, look inside the action and carefully examine the chamber and magazine. If they seem to be empty, work the action a couple of extra times, examine it carefully again, and put in your clearing block or latch it open. If you don't have a clearing block, you can use the blunt end of a pencil, a small pocketknife, or a clean branch—almost anything to hold the action open and to show it is open.

If you find ammunition in the gun when you first examine it, you may have to work the action back and forth until you get it all out—and then work it a couple of more times to be sure, before you examine it. While it is not a good idea to run the ammunition through the action, in and out of the chamber, it may be the only way you can figure to get the gun unloaded. *Watch the muzzle!*

It isn't a good idea, either, to flip the cartridges out on the ground, if you can avoid it. But again, the important thing is to get the gun cleared. Try to do this safely without dropping the cartridges on the ground, but watch the muzzle.

The semiautomatic action will be found in .22-caliber rifles, high-power rifles, and shotguns.



### Pump Action

#### 3c (1) Rifle or shotgun (b) Pump action

The pump action gun is considerably easier to clear than the autoloader, since it does not have that strong bolt-closing action spring to contend with. The pump action is operated by sliding the pump handle, located under the barrel, back and forth.

To avoid the possibility of the action being pulled open just as the trigger is pulled, most pump guns lock the action closed when the hammer is cocked. It is necessary to press an "action release" button or lever, which permits you to slide the action open. The action release lever or button is usually on the underside of the gun in the vicinity of the trigger guard. The safety is often in this same general area, and you may confuse this with the action release. The safety normally has two positions

and will stay in either position. The action release is usually spring loaded, and you must hold it depressed while you start the action open. With the action release pressed, it may be necessary to move the slide handle forward slightly before it will release and come to the rear.

Once you get the action unlocked and open, follow the usual procedure of examining the chamber and magazine carefully. If there is ammunition in the gun, you may have to get it out by working it through the action. Watch the muzzle! Don't forget that you have to keep the action release depressed if you clear the gun in this manner.

Once the gun is cleared and you have double-checked, leave the action open with the slide handle pulled all the way to the rear. This tells you and your companions that the gun is open by the position of the action or by the position of the slide handle.

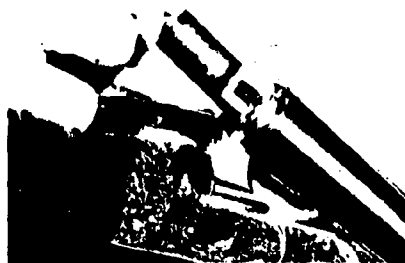
The pump action will be found in .22-caliber rifles, high-power rifles, and shotguns.

## Break-Open Action

### 3c (1) Rifle or shotgun

#### (c) Break-open or hinge action

The break-open or hinge action is not as popular in this country as it was at one time. It is mostly confined to shotguns,



The break-open shotgun holds one or two shells and is easy to make safe. After the action is opened, the shells can be easily removed and stored.

although you may occasionally find a rifle of this type.

The hinge action is one of the easiest to clear, and it is very easy to tell when the action has been cleared. This type of gun usually has two barrels, either side by side or one above the other. The single barrel gun is not uncommon, and you sometimes may run across one (usually foreign made) with three or four barrels.

The barrels are hinged a few inches ahead of the breech, so that the muzzle swings downward. A lever on the top of the action, behind the breech, is pressed sideways to unlock the barrels from the action. With the

The double-barreled shotgun is opened by pressing the top lever sideways.



right hand holding the grip and the right thumb pressing the top lever to the right, the left hand can force the barrels to pivot on their hinge. The barrels open enough to permit easy access to the chambers and are prevented from opening farther. With the gun fully open, it is easy to put cartridges into the chamber or take them out. The cartridges are often lifted slightly out of the chamber by the extractor.

Clearing this type of gun is very easy, as you can see. You merely break it open and lift the cartridge out of each barrel. There is no magazine to worry about. Leave the gun open.

## Bolt Action

### 3c (1) Rifle or shotgun

#### (d) Bolt action

The bolt action is a fairly easy type to clear as it does not have many tricks, and the action is usually exposed so that you can see in it. There is no strong spring forcing the action closed, as with the semiautomatic, but you will have to overcome the strength of the firing-pin spring in operating the action. Some guns cock the firing pin as the bolt handle is lifted, but once this is done the action is easy. If you have unusual difficulty in raising the bolt handle, check the safety. In some cases it is designed to



This bolt action rifle has an open top receiver, letting you see into the magazine and chamber.

keep the bolt handle from being accidentally raised.

The bolt action is opened by grasping the bolt handle, lifting it, and pulling it to the rear. Examine the chamber, the action, and the end of the magazine carefully. It may be necessary to work the bolt back and forth a few times to remove any ammunition that may be in the gun. In some cases, it is not necessary to turn the bolt handle down, but merely sliding it back and forth will be enough. In other cases, it may be necessary to go all the way and turn the bolt handle down. Don't unless you have to, however. When this action has been cleared, leave the bolt open and fully drawn to the rear.

The bolt action will be found in .22-caliber rifles, high-power rifles, and shotguns.



This lever action rifle has an external or exposed hammer.

### Lever Action

#### 3c (1) Rifle or shotgun (e) Lever action

The lever action does not have any special tricks, except that in many cases it may be difficult to get a good look into the chamber, magazine, and action, due to the well-enclosed receiver.

The lever usually surrounds the trigger, acts as a trigger guard, and is hinged at the front end. Be careful to keep your finger away from the trigger when you reach in to get the lever. Swing the lever down, examine the chamber, action, and magazine, and leave the lever open if there is no ammunition in the gun. If there is, you may have to operate the lever a few times to work the ammunition out of the magazine. When you are sure that it is all clear, leave the lever open all the way.

The lever action is popular in .22 rifles and high-power rifles. Although lever action shotguns have been made, they are no longer popular.



Keep your finger away from the trigger when clearing the lever action rifle.

### Muzzle-Loader

#### 3c (2) Muzzle-loader of any kind

The muzzle-loader was the original type of gun. It was largely replaced by the breech-loader many years ago, but now there is a growing interest in shooting muzzle-loading guns, and you can buy muzzle-loading guns of today's manufacture. There are many old muzzle-loading guns in collection, hanging on the wall, hidden away in the attic, etc. Since there are so many around, you should know something about the peculiar problems of safely clearing a muzzle-loader.

The muzzle-loader does not use the complete metallic cartridge with which you are familiar. Instead, the powder charge, the bullet, and the priming are loaded separately. For convenience in carrying, the components are sometimes packed together in a paper cartridge, but they are loaded separately. As you might guess, the powder is dumped in the barrel from the muzzle. The bullet is put in the barrel from the muzzle, with or without wadding. Once these elements are rammed in place, there is no way to tell by looking at it whether the gun is loaded or not.

Some muzzle-loaders are primed by a percussion cap. This is a copper cap about the size and

shape of a pencil eraser, which slips down over a small nipple extending out of the side of the barrel. The cap contains a priming compound which fires when it is crushed against the nipple by the hammer. The flame from the primer squirts into the chamber and sets fire to the powder. If you have a percussion muzzle-loader, the first step is to point it in a safe direction and put the hammer on the half-cock notch. You can then examine the face of the hammer and the nipple for a cap. If you find one, carefully remove it. A cap is powerful and sensitive to heat or a blow.

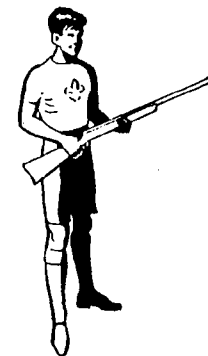
If your gun is not of the percussion type, it probably will be a flintlock and it will have a hammer which strikes flint against steel. The shower of sparks from the flint and steel is directed into a small pan on the side of the rifle. The pan holds a small quantity of black powder for priming, which carries the fire to the main charge through a flash hole in the chamber. With this type of gun, put the hammer on the half-cock notch and raise the cover over the pan. Blow or wipe out any priming powder on it.

Even though you have taken care of the priming problem, you still haven't determined if the gun is loaded or not. Because it takes a little knowledge to check this, many muzzle-loaders have remained loaded for years with-

### Gun Safety in the Field

3d Show: (1) Safe carrying of a gun when alone or with other hunters

There are many ways of carrying a gun in the field. The method you use at any moment will depend on where your companions are located and on the kind of ground you are walking on, the sort of terrain you are going through.



Safe handling of a gun in the field is based on a few sensible rules. The first is that basic rule for all safe gun handling—keep the muzzle pointed away from people (and that includes you)! Carry and protect the gun so that if brush or a twig should catch on the trigger or hammer and fire the gun, no one will be in the line of fire.

You have to amplify that rule a bit when in the field. You never know when you're going to catch your toe under a tough vine or when you are going to slip. You may take an unexpected spill any time. When you do, your gun is likely to hit the ground with a crash and fire. So the second rule is that you carry the gun so that the muzzle will be pointed in a safe direction if you fall.

And, of course, you will follow the basic rule of all shooting that you don't put your finger on the trigger until you are all ready to

shoot. Keep your trigger finger out of the trigger guard until the last moment before firing.

The safety—sure, you'll keep the safety on until you are just ready to shoot. If you don't shoot, you put the safety back on. But as you learned earlier, the safety is merely an additional precaution to other safety measures you take. Don't rely on the safety for complete protection.

You have to keep track of the other hunters in your party, both for safe carrying of your gun and for safe shooting when you find game. If there is any doubt where the others are—*don't shoot*.

There are many ways of carrying the gun, and the one you use at any moment will depend on the extent of the brush, trees, etc., and on where the others of your party are located. You can, for example, carry the gun at your side, held by one hand at the balance, with the muzzle pointing

forward. This would be dangerous if there were someone ahead of you. You can cradle the gun in your left arm, but not if anyone is on your left side. If you carry it on your shoulder, muzzle pointing to the rear, watch out that there is no one behind you, or else carry it with the trigger guard up. There are so many possibilities in the field that you have to apply the general rules and common sense.

If you are carefully working your way along a steep, slippery hillside or fighting your way through head-high brush, you couldn't shoot even if you did scare out any game. So why take a chance with a loaded gun under these bad conditions? Open the action in such a situation and you will be much less likely to get in trouble. That's another angle of this general rule of not loading the gun until you are

ready to shoot and of unloading it when you are finished shooting or are not able to shoot.

In all this gun handling in the field, watch out for getting mud, snow, etc., in the barrel of the gun. Keep the muzzle off the ground and out of snowbanks. If you fall, clear the gun and examine the barrel. If there is any obstruction in the bore, clean it but don't shoot it!

Safe carrying of a gun includes knowing what to do with it when you are not actually handling it. One of the general rules is that you *never let a closed and loaded gun leave your hands*. If you are going to lean your gun against the car, lean it against a tree, lay it on the ground, or hand it to a companion momentarily; open the action at least. Depending on the circumstances, you probably will want to clear it, but at least open the action.

## Loading and Unloading

### 3d Show: (2) Proper relationship of hunters when loading and unloading guns

There are a couple of precautions you must take when loading or unloading a gun in the field or at any time. You may get so interested and intent on getting the ammunition in or out of the gun that you don't pay enough attention to the muzzle and let it drift in a dangerous direction. There is also some increased chance of the gun going off accidentally when you are working ammunition through the action. If you pay attention to these points and our basic gun-handling principles, you shouldn't have any trouble.

On the target range you don't load until you are in position and all ready to go. In the field you don't load your gun until you have moved out where there is a chance of finding game. Likewise, you unload your gun as soon as there is no chance of finding game. You clear your gun when you come up to talk to another hunter or a farmer.

You load and unload your gun as far away from other people as you reasonably can. In any event, you must be careful to keep the muzzle pointed in a safe direction. When you're in the field, it is generally best to keep the muzzle pointing up in the

air. Pointing it at the ground is not quite as safe, since a shot fired at the ground may glance off in another direction.

Once you have cleared your gun, you leave the action open as a constant reminder that this is a safe gun. As an expert on the subject of safe gun handling, you should be sure that your companions in the field also follow the proper, safe procedures. If they don't know, you should teach them how.

## Guns and Cars

### 3d Show: (3) Safe handling of a gun when taking it out of and putting it in a car

To begin with, you NEVER, NEVER have a loaded gun in the car. Not only is it very dangerous, but it is against the law in most localities!

Even though you never put a loaded gun in the car or load a gun while in the car, you follow the basic safety rule of treating a gun in the car as loaded if the action is closed. If you find a gun

with the action closed, you position yourself so that the muzzle isn't pointed toward you as you take the gun out of the car—and don't let it point at your companions. Immediately, when you get it out of the car, you go through the usual clearing procedure, ending with the chamber empty, the magazine empty, and the action open. If you find a gun laying on the car seat, don't grab it by the muzzle and drag it toward you. Keep the muzzle pointed away.

Check your local laws for the rules about carrying guns in a car. Your State hunting laws will often be specific on this subject. Some merely require that the gun be unloaded, while others may demand that the gun be unloaded and either taken apart or put in a case. Even if the laws don't require it, it's a good idea to carry the gun in a case when you have it in a car. The case will protect it and keep it from being scratched or dented or its sights being damaged.

## Crossing a Fence

### 3d Show: (4) Safe gun handling when crossing a fence

There is only one thing to be said about crossing a fence with a gun — DON'T!

If you are hunting by yourself and come to a fence that you can't easily step over, be safe.



Unload your gun and slide it under the fence before you try to cross.

Clear the gun, leave the action open, and slip the gun under the fence, muzzle pointing away from you. Move down the fence a few feet away from the gun and go over, under, or through the fence. Then go back and pick up your gun. If you planned it right, the gun muzzle will be pointing away from you all the time.

There is one bad thing about this method. If the ground is muddy or covered with snow, you may get mud or snow in the action or barrel. This is something to watch out for, since they may jam the gun or make it unsafe. If conditions are bad, you may have to lean the cleared and open gun against a bush, tree, or fencepost. Be sure the gun is supported solidly so you won't accidentally knock it over as you cross the fence.

You may be tempted to clear the action and take the gun with you as you negotiate the fence. Although it may not be unsafe if you have cleared your gun, this is still a very poor idea.





Carrying the gun with you increases your difficulty in crossing the fence and more importantly, you are very liable to bang or drag the gun against the fence, marring the finish on the stock or metal parts. It's easy to get tangled up in a fence and take a spill, and you may end up breaking the stock or otherwise seriously damaging your gun.

If you are hunting with someone, you can both use this procedure for getting across the fence or you can join forces. Your companion can hold both guns while

If you are hunting with a buddy, you can hand him your open gun while you cross the fence—then you hold both guns while he crosses.



you cross and then you reach over the fence and get both guns so that he can be free to cross. If you do, remember that you never let a loaded gun leave your hands. Clear your gun and leave the action open before you hand it to your companion.

But whenever you are tempted to cross a fence with even an unloaded gun in your hand, think again and don't do it!

### Safe Zone of Fire

**3e Explain what is meant by "safe zone of fire."**

A bullet is a mindless bit of metal and will hit anything that gets in its way—good or bad. Once you pull the trigger, you're responsible for that bullet all the way. You are not finished with it until it finally comes to rest. So it is up to you to be sure that the bullet accurately hits only the target you want or that it goes in a safe direction.

You'd better know what lies between you and your target and what lies beyond your target. The bullet fired from a .22 rim-fire rifle has a maximum range of about a mile—and even at that distance is capable of doing damage. A high-power deer rifle can be dangerous at a distance of a couple of miles. Air guns and gas guns have a much shorter range. The shotgun with usual shot loads has a maximum range of

about 200 to 300 yards. Buckshot or the single slug will have a greater range.

A bullet or shot charge that hits a glancing blow on a rock or a piece of concrete or a water surface is likely to skip off and keep right on going. Or it may even glance off and go in a new direction. While it is important to know what you are shooting at, it is also important to know what you are shooting against!

A safe zone of fire is one where the bullet or shot charge is safely controlled or contained, as on a rifle range or shotgun field. A safe zone of fire can also be an area where there is no chance of anything being endangered clear out to the extreme range of the bullet or shot charge.

Such a safe zone can change as you move around or as other people move in the area. When you are hunting with other people, it is necessary that you know where they are all the time. It is mighty easy to lose track of your companions momentarily in the woods and brush. If you don't know; don't shoot!

### Safe Storage

**3f Explain the principles of safe storage of guns and ammunition at home.**

There are two things to consider on this subject—storage of the gun and ammunition so

they will not be damaged and storage of the gun and ammunition so no one else can get hold of them and cause an accident!

Ammunition is best stored in a cool, dry place; but, if you have only a small quantity and don't expect to store it for years, almost anywhere in the house should be all right except an area near the furnace, furnace ducts, or a stove. You want to keep ammunition stored away from these for safety's sake.

The gun itself should also be stored in a cool, dry place if possible. It is especially important that the place be dry, so that rust won't form on the inside and outside of the metal parts.

These precautions will ensure that the rifle and ammunition are stored so they won't be damaged. It is more important to store them so that other people can't get at them to cause accidents. This is especially necessary if there are children around your house.

Since ammunition can be dangerous if it is played with and since a gun doesn't become dangerous until it has ammunition in it, the main thing is to store the ammunition in a locked cabinet away from the gun.

The gun itself should be stored in a locked cabinet. And, of course, you wouldn't think of storing it with any ammunition in it! But every time you pick it



Ammunition should be stored away from the guns in a locked cabinet.

up, open the action and check to be sure it is unloaded. Keep that action open until you are ready to put the gun away or put it in its case.

The other people who live in your house should be taught the essentials of safe gun handling, so that if the necessity should arise they can clear a gun and know how to handle it safely. Young brothers are especially interested in such things. As soon as they are old enough, they should be taught safe gun handling but should be strictly forbidden to touch your gun unless you are present.

### Showing a Rifle

**3g** Explain what you would do if a friend visiting your home asked to see your target rifle.

I would ask him to wait while I got the rifle. I would get the rifle from the cabinet and carefully open the action and examine the chamber and magazine. I would explain to him the interesting features of the rifle, and I would explain to him the basic safety features of keeping the action open and keeping the muzzle pointing in a safe direction. If he wanted to handle the rifle, I would then give it to him, while I watched carefully to be sure he handled it safely.

### Care of Guns

**3h** Explain the care needed to keep a gun in good and safe working condition.

Part of the *pleasure* of handling a gun is the proper maintenance of it. Part of the *responsibility* of owning a gun is its proper maintenance and care.

Maintenance and care are necessary to keep a gun in a reliable, safe, operating condition. A gun that is rusty and dirty won't look good, may not operate properly, and may actually be unsafe.

A gun is a beautiful thing—when it leaves the factory. It has many metal parts that have been

very carefully machined, inspected, tested, polished, and given some sort of attractive finish. The wooden parts have been made from a piece of carefully selected wood, turned precisely to shape, carefully sanded and smoothed, and given a handsome protective finish. A new gun is a delight to see and a delight to handle. It not only looks good but it feels good.

It is up to you how this gun will look and feel after you have used it awhile. It only takes a little bit of ordinary care to keep from having the gun all marred, dented, and scratched. Carry the gun in a case when possible. Don't throw it down carelessly or let a bunch of junk get piled on it in the car trunk. Just a little care will work wonders and will mark you as a knowledgeable, expert gun handler.

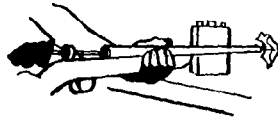
Most of the parts of a gun are made of steel, and many of them are blued. In any event, whether blued or not, all the metal parts need a light protective coat of oil to prevent rust from atmospheric conditions. When you are on the range or carrying the gun in the field, you wipe off the oil so it won't gather dust and dirt. But you apply the protective coat when you get home. It's a good idea to have a very lightly oiled wiping rag stored in a metal container near the gun so that you can wipe off the fingermarks

after the gun has been handled. The salty perspiration from your fingers and hands is very likely to cause rust.

The inside of the barrel needs only a little more attention. After you are done shooting, wipe out the bore with a dry patch or two and follow with a patch lightly soaked in preservative oil. Before you go out to shoot next time, wipe the barrel out with a dry patch to clean it.

The smoothbore shotgun tends to pick up a thin coating of lead from the lead pellets as they pass down the barrel. This usually is found just ahead of the chamber in the forcing cone and near the muzzle in the choke. If you see dark, dull, irregular streaks in the bore, this could be lead. It is easily removed by putting a wad of fine steel wool on the end of the cleaning rod and scrubbing the bore a few strokes until the leading is gone. If your .22 rifle or pellet gun begins to shoot poorly, it might have some lead in it. A brass bristle brush will usually clean out the bore in good shape. When you are finished, use a light coat of preservative oil.

Like any other piece of machinery, the gun mechanism should occasionally be cleaned and lubricated. A gun that is used in the field will get dusty, and some of this dust will get into the working parts. During



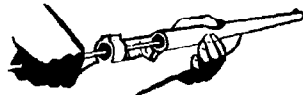
Clean barrel and metal parts with a good commercial solvent.



Clean bore until dry patch comes through as clean as possible.



Run oily patch through barrel.



Bore should be cleaned through breech end where possible.

shooting, bits of unburned powder or carbon may work their way into the action. Previous lubrication will dry up and get gummy or sticky. If a gun is used much, the mechanism should be cleaned rather often. But if it is not used much, a cleaning once a year should be enough.



All metal parts should get light coat of oil.



Store in horizontal position.



After storage, run clean patch through bore before firing.



Remove all excess grease and oil.

*Before you start to work on your gun or clean it, be sure that it is unloaded and that there is no ammunition in the area.*

Be very careful to follow the maker's directions in taking the gun apart and putting it back together again. It is not necessary to take it down to the last

pin and part, but only far enough so that you can clean it properly. The less you take apart; the better off you are.

The action should be *lightly* oiled. A little lubricant is enough, and twice as much is not twice as good. Excess oil will run out of the action onto your clothes or into the stock and will generally make a mess of things.

Don't ever try to replace or repair a broken or damaged part, unless it is some of the woodwork. You may think a nail is a fine replacement for a missing firing pin, but it can be very dangerous. If you find a part missing or damaged, take the gun to a good gunsmith.

Aside from the barrel and action, the rest of the gun doesn't take much care. If you have a leather sling, a little bit of neat's-foot oil or other leather preservative applied from time to time will keep it soft and flexible. A little linseed oil or other stock finish will help hide any scratched or worn places on the stock.

You might think that storing the gun in a nice sheepskin case would keep it from rusting. Who ever saw a rusty sheep? But a case made of sheepskin, leather, or cloth may gather moisture and cause the gun to rust. And

worse, you won't be able to see what is happening. A gun is best stored in the open or in a clear plastic case.

And, of course, you never leave a cleaning patch or anything else in the barrel! It is unnecessary and dangerous. You may forget about it and fire a shot with the obstruction in the barrel, probably blowing up the gun. All that is needed is that light coat of oil. Wipe it out completely before you start shooting.

We have mentioned it before, but this is a good time to mention it again—keep the barrel clear! In the field it is easy to get mud, snow, and dirt in the barrel if you aren't careful. If there is any question, clear the gun and look through the barrel. If it is not clear for the whole length, clean out the obstruction. If you are not able to clean it out, take the gun to a gunsmith for service. *Don't try to shoot an obstruction out.*

Any time your gun begins to misfire, fails to feed properly, fails to eject, or seems hard to operate—that is the time to stop and see what is wrong. You may have a broken part or dirt or a twig in the action. A poorly functioning gun is dangerous. Be sure your gun works properly!

# Shooting Skills

You can learn a lot about rifle shooting at camp and any other indoor or outdoor place that has a shooting range that comes up to NRA standards. Qualified instructors are on hand to correct the mistakes and to make sure all safety regulations are observed.



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Shooting at clay pigeons is great fun whether you use the .22-caliber Mo-Skeet-O type gun or one of the many sizes of shotguns. With enough practice, you can make a creditable score and feel that you are ready for a little competition or the thrill of a hunting experience.



## SHOOTING HELPS

Additional assistance in problems concerning hunting, shooting, range construction, organizing clubs, etc., is available.

The National Rifle Association promotes rifle and shotgun shooting. It is the governing body for most rifle shooting in the United

States. It conducts instructions, competitions, and qualification programs. The NRA will provide assistance to junior clubs, senior clubs, or individuals. It publishes a monthly magazine, *The American Rifleman*, on guns and shooting, as well as a number of book-

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lets on various aspects of shooting, training, building ranges, organizing clubs, etc. For information write National Rifle Association, 1600 Rhode Island Avenue, Washington, D.C. 20036.

The Director of Civilian Marksmanship is an official of the U.S. Army who provides assistance to organized junior and senior clubs. He can provide limited quantities of rifles, ammunition, targets, and other help to clubs that meet the requirements. Write Director of Civilian Marksmanship, Department of the Army, Washington, D.C. 20315.

The Amateur Trapshooting Association is the governing body for most trapshooting in the

United States. Write the Amateur Trapshooting Association, P.O. Box 246, West National Road, Vandalia, Ohio 45377.

The National Skeet Shooting Association is the governing body for most skeet shooting in the United States. The NSSA can provide rules for skeet shooting, building a range, forming a club, etc. Write National Skeet Shooting Association, 2608 Inwood Road, Dallas, Tex. 75235.

The National Shooting Sports Foundation, 1075 Post Road, Riverside, Conn. 06878, and the various individual arms and ammunition companies can provide helpful advice.

## ACKNOWLEDGMENTS

Col. Edward B. Crossman, author of this merit badge pamphlet, is nationally recognized as a firearms authority and ballistics expert. His by-line, "Col. Jim Crossman," has gained repute in *The American Rifleman*, *Sports Afield*, and other shooting and ordnance magazines. His own experience as a camp staff member, Life Scout, and adult leader has fired the enthusiasm shown on these pages for the shooting game.

The Boy Scouts of America is grateful to the National Rifle Association for its assistance in

preparing this pamphlet. Valuable guidance has been received from its editorial services and permissions granted to use or copy illustrative material.

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# design in action

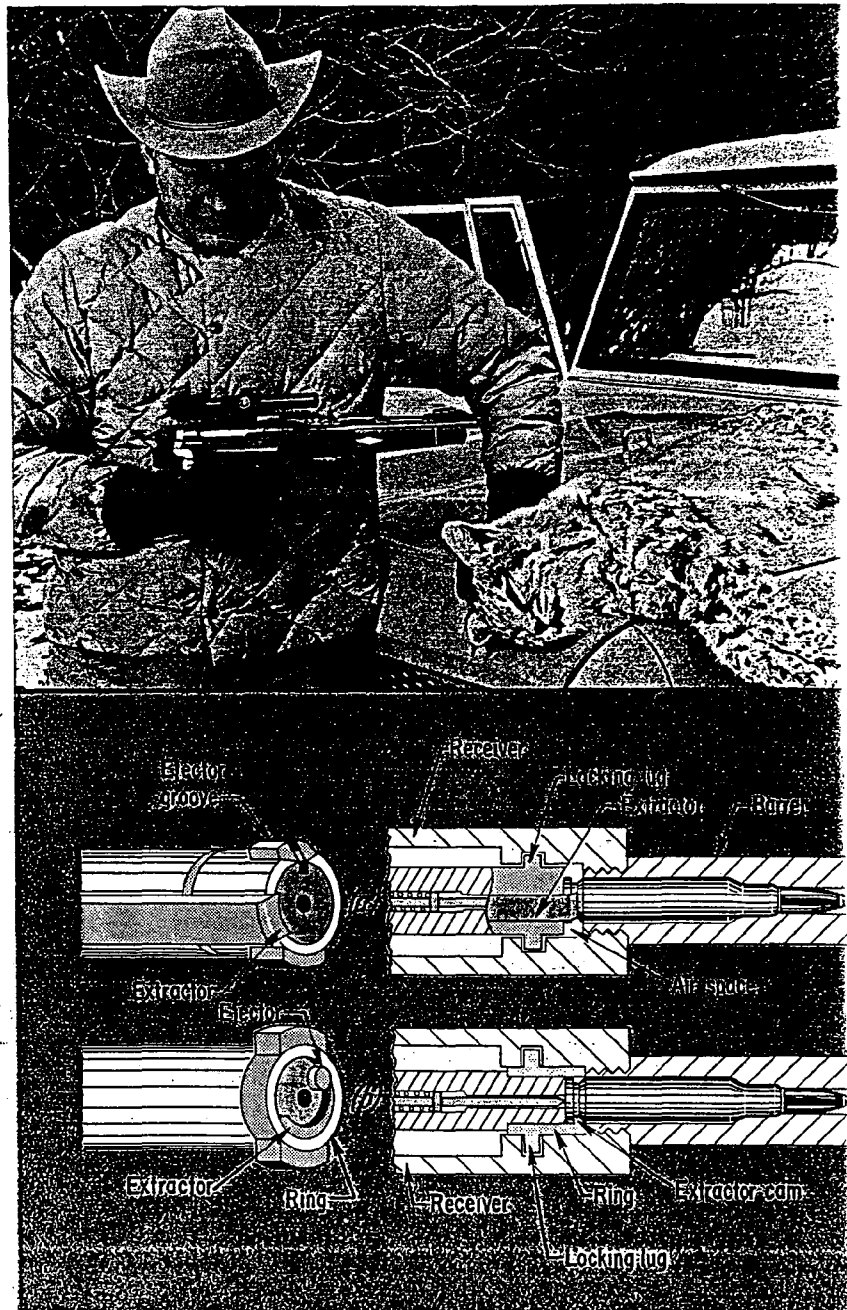
## Scoped Bolt-Action Pistol Wipes Out Varmints

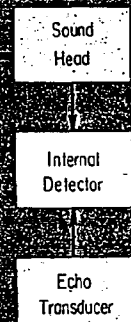
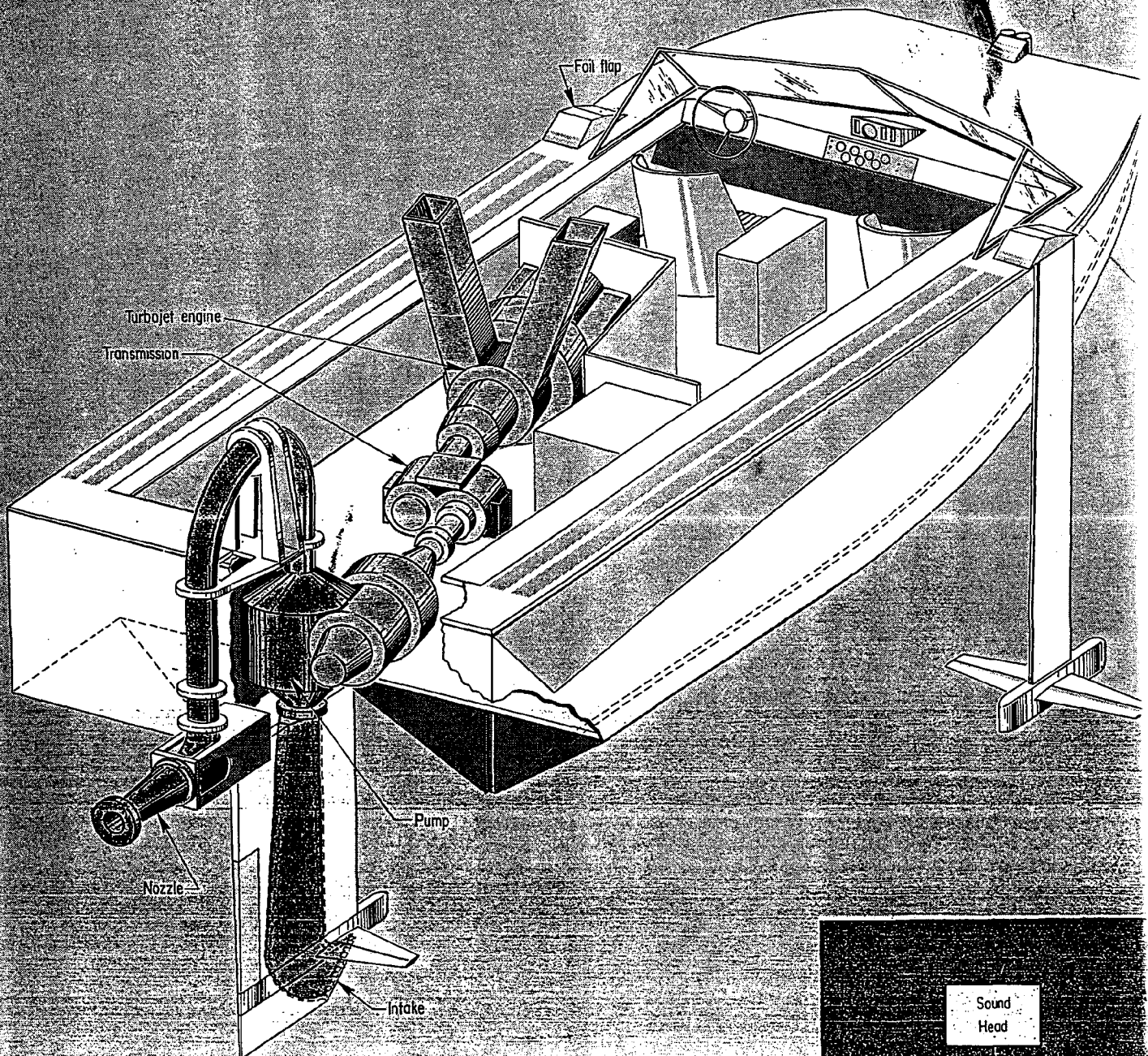
For many varmint-hunting aficionados, the scoped handgun is replacing the rifle as the ultimate sporting way to shoot game. As far as accuracy is concerned, however, the optical qualities of telescopes and the ballistic capabilities of modern rifle cartridges far outclass ordinary pistols. Remington's solution to the problem is their new XP-100—a .221, single-shot, scope-toting firearm that combines some characteristics of rifles and pistols.

Outer-space shape of the DuPont Zytel structural-nylon stock is both functional and comfortable, aiding the shooter in holding accurately on target. Precision molding assures that bedding (mating of barrel surface with stock groove) is absolutely uniform. Uneven bedding is a major cause of "wild-shooting" guns.

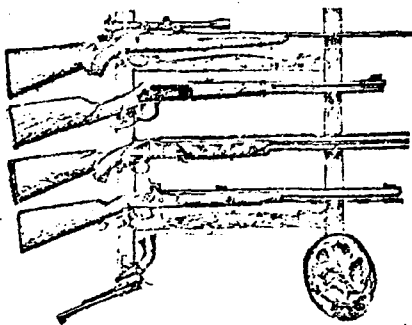
The bolt surrounds the cartridge base—the place where dangerous case rupture is most apt to occur—with a ring of steel. The Fireball cartridge, originally developed as a high-velocity varmint cartridge for rifles, generates high chamber pressures. In former bolt designs, *a*, the lip of the extractor extended around the flat face of the bolt to grip the fired case and pull it from the chamber. In the XP-100 bolt, *b*, a spiral land cams onto the cartridge rim as the bolt is closed.

Designed by Remington Arms Company Inc., Bridgeport, Conn. Photos courtesy of Les Bowman, LB Ranch, Cody, Wyo.









## Hunting Guns:

# A Different .375 H&H Mag.

By Tom Gresham

One of the really pleasant things about being a hunter in the United States is that you can buy any sporting arm you want without having to justify it to anyone. In fact, I sometimes end up with guns that I can't justify even to myself. But that's OK because the joy of owning a gun, be it unusual or fancy or just a plain Jane variety, is reason enough for owning it. That's really the reason I now have a new addition to what some might loosely refer to as a collection of guns.

All my life I had read about the .375 H&H Magnum, and I longed for a rifle that would chamber the cigar-shaped cartridge. This is the round most often mentioned in discussions of the best all-around hunting load for anywhere in the world. It earned its fame on the game fields of Africa where everything from elephant to dik dik (a rabbit-sized antelope) have been taken with it.

Although I had no plans to go to Africa, I wanted to be ready if some long-lost relative called and said he was heading to Alaska for grizzly or Africa for anything and wanted to take me along as a birthday gift. (When I dream, I don't fool around.)

When I decided to get a .375, I ran into a problem. Having switched to shooting from the left shoulder years ago after discovering my left eye was my master eye, I now found there was a distinct lack of left-handed bolt action .375s on the market. No problem though. I just bought

a left-handed, barreled Model 700 action in 7mm Rem. Magnum from Remington, bought a .375 barrel from the same company and had their custom shop swap the barrels and do a little fiddling with the feed rails to accommodate the larger cartridge case.

I then sent the newly barreled action to Lee Six in San Jose, California so he could put it in a fiberglass stock. Six had stocked a 7mm magnum for me when he was in partnership with Chet Brown, and that gun is now my favorite. He told me he had a left-handed classic stock he thought I would like so I decided to try it. Unlike most hunters who use fiberglass-stocked rifles, my primary concern was not with weight. Nobody wants an eight-pound .375 H&H! I didn't want the gun to be too heavy, but I also wanted it to keep shooting straight even if I ended up hunting brown bear in pouring rain for a week. A wood stock can soak up water and warp, causing a shift in the bullet's point of impact. Fiberglass is impervious to the elements. Fiberglass is also quite strong, and should a horse decide to roll over with my rifle still in the saddle scabbard, the gun might stand a better chance of surviving than if it had a wood stock.

Everytime there is an article in one of the gun magazines about rifles with fiberglass stocks, the author makes a point of saying that the stocks are ugly. While it's true that the synthetic stocks don't

have the figure of a fine piece of walnut, to me they are pretty in their own way. For one thing, the classic stock on my new gun has really beautiful lines. The comb is high — positioned perfectly for use with a scope. Since I'm a believer in form following function, a gun that shoots well and maintains a consistent point of impact appeals to me more than a beautiful but unstable wooden handle.

When I pulled the newly stocked rifle from the shipping box, I immediately noticed that Six had eliminated one of the few complaints I had about my 7mm glass-stocked gun. On that gun, the stock is smooth and is slick in the hands during a rain storm. The new gun has a dull, almost sand blasted finish that is as sure in the hands as good checkering.

The stock comes with a Pachmayr recoil pad and quick-detachable sling swivels, and it didn't take me long to top the rig with a Redfield 1¼X to 5X Widefield

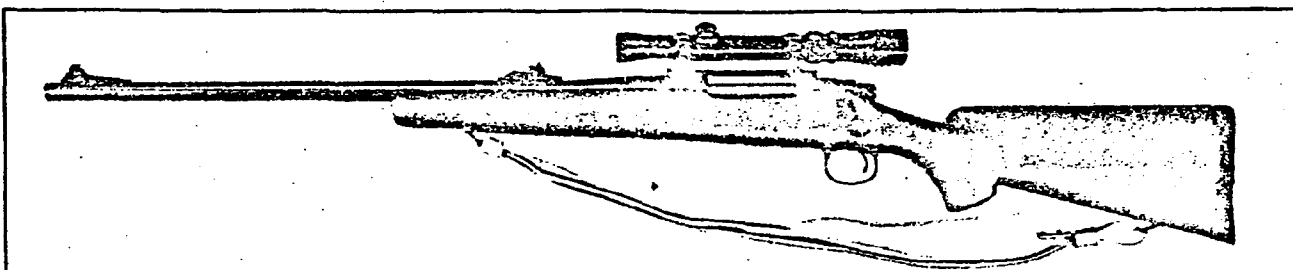


With handloads that duplicate the .375 Big Bore's ballistics, the .375 H&H Magnum is a good whitetail deer cartridge.

scope. The complete package — rifle, sling, scope and mount — weighs just two ounces shy of 10 pounds. With the heavy barrel and light stock, the gun is muzzle heavy which helps hold it steady during offhand shooting.

Rifles in .375 chambering have a reputation for shooting well, and this one lived up to that. So far, I've had it to the range for only limited shooting, but it shows promise of being a fine shooter. It's

*continued on p. 77*



The straight Fiberglass stock is constructed to position the shooter's head in line with the scope. The stock is plain, but functional.





# LETTERS

**SHOOTING TIMES** welcomes comment from its readers on any material published in its editorial columns. Letters should be under 200 words and signed. Anonymous letters will not be printed, but names will be withheld upon request. We reserve the right to edit letters for reasons of space. Address letters to: Executive Editor, Shooting Times magazine, News Plaza, P.O. Box 1790, Peoria, IL 61656.

## Are New Bolt-Action Rifle Safeties An Improvement?

I haven't seen any reference in *Shooting Times* to the changes Ruger and Remington have made to their bolt-action rifle safeties. A year or so ago, both companies eliminated the bolt-locking feature on their two-way safeties so the chamber can be unloaded with the safety on.

This may have been a commendable decision in the interest of product liability, but I consider it a disaster for hunters. Try carrying one of these new rifles slung on your shoulder through heavy brush or timber, and I guarantee a branch will pull the bolt handle up from its fully locked position, thus disabling the piece.

I discovered this "improvement" the hard way when it cost me the only elk I saw last year. I've since traded my newest Ruger Model 77 for a pre-'84 Winchester and would be interested in comments from your contributing editors on this change.

It wouldn't surprise me if "pre-'84" Rugers and Remingtons become collector's items.

Jack Pollock  
Lighthouse Point, FL

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6 SHOOTING TIMES/NOVEMBER 1985

## Ponsness/Warren Is Back

IDGAS Enterprises Inc., a new Idaho corporation, has purchased the patents and tooling for all Ponsness/Warren products and has resumed the manufacturing of these high-quality, shell-reloading products. In addition to continued dealer activities, in order to provide better availability and service for the user, all products, parts, and service are now available direct from the factory.

The main elements of the factory direct marketing strategy are national consumer advertising for product awareness, guaranteed source for products and service, and most important, a reduced price for the shooter.

IDGAS Enterprises is introducing a new improved 800 Convertible Shotshell Reloader with interchangeable dies and tooling, new improved crimp starter for all gauges, and primer feed assembly. With a simple change of tooling, this new machine will now load four gauges. This reloader features the same high quality as all Ponsness/Warren products, yet, in keeping with the new lower pricing policy, it is in the \$500 price range.

For further information or to place your order, write: IDGAS Enterprises Inc., 1000 West Hubbard, Coeur d'Alene, ID 83814; phone: (208) 664-1596.

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## Thanks For The Dumb Crooks

I'm writing to thank Jerry Constantino for his "For Your Information" column. I find it to be very much of interest, and it's especially helpful in preparing "progun ownership" talks and presentations for the general public. As a long-time member of NRA (57 years), some 20 years on the NRA Board of Directors, and a background of 29 years as a Detroit policeman, I like to be prepared with some good arguments on the progun side. It helps a lot when one can throw out some humor along with the statistics. The "dumb crook" items have helped me win several confrontations with antigun people.

Harry Reeves  
Andrews, NC

## Buck Knives Backs Its Blades

On a recent camping trip, I accidentally broke my folding lock-blade Buck knife No. 110. I broke the blade and bent the handle, rendering the knife completely useless.

I mailed the knife to Buck Knives Inc., requesting that the company replace the blade and, if at all possible, straighten the handle. Only five weeks after I sent in my broken knife, I received a new knife at no charge.

It's nice to know there are still companies offering the public quality products and service.

Paul Whitney  
Lancaster, CA

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# Classic Rifles

Ken Waters

## The Remington Models 721 and 722

**J**UST 39 YEARS AGO, we were reading announcements in hunting journals of the advent of a totally new centerfire bolt action rifle. By the summer of 1948, it had been close to four years since the end of World War II and American arms manufacturers were beginning to recover from the hectic postwar period with its pent-up demand and multitude of conversion, procurement and production problems.

There were rumors aplenty as to what we could expect from the big gun companies but in truth, few of us were aware what Remington Arms had in store for us. If my recollection is correct, a popular concept was that changes would be largely cosmetic, probably involving streamlining of prewar bolt actions.

Were we ever wrong! The new Model 721 rifle that Remington introduced, though extremely clean-lined, displayed no exotic contouring. Rather, it could be said to have had an overall appearance of austerity, no doubt prompted by its designer's mandate to hold down costs. In that regard, he was eminently successful: the stock bore no checkering, pistol grip cap or contrasting forend tip; there were no sling swivels and the open iron sights were of the simplest, inexpensive type. The work of the economy axe was also seen in the single steel stamping that formed the trigger guard and magazine floorplate.

Lest I seem to convey too critical a reaction, consider what those rifles had to offer that was new and different. They were the first American-made bolt actions with the bolt head fully enclosing the cartridge bases; the first to eliminate extractor cuts by placing both extractor and ejector inside the bolt head; and the first to utilize a spring-loaded plunger as an ejector. Those were

big changes that set precedents for other manufacturers and later rifles.

The second mandate was to produce a system of breech closure that would provide shooters with increased security from cartridge case failures and escaping gas. That objective placed major emphasis on receiver and bolt design, which is where the important changes took place, and there too they were successful.

First, the bolt's front locking lugs were made larger to increase resistance to rearward thrust in firing. Considering that the bolt lugs of most of the better rifles then in existence were amply strong and that the brass cartridge case was actually the weakest component, the measures taken to support a chambered case and control escaping gas in the event of a case rupture claimed first priority.

To accomplish that, as noted earlier, the bolt face was rebated to leave an unbroken steel flange or rim around its circumference. On closing the bolt, the flange enters a mating recess in the barrel breech, completely enclosing the rim and extraction groove area of a chambered cartridge. There are no cuts for extractor or ejector in the encircling ring; both had been relocated to the bolt face, inside the ring.

If any gas does manage to escape, it must first travel around the ring, changing direction at least twice before reaching the locking lugs where a sizable gas escape port is located. Should any remaining gas succeed in bypassing the port, it would be deflected away from the shooter's face by the bolt head shroud. Shooter safety had thus taken a giant step forward; had, in fact, gone about as far as it is conceivably possible to go with a breech-loading repeater.

A third objective appears to have been incorporating a really good, almost match-quality trigger in a hunting rifle. Gone was the old military trigger with its double-stage pull so thoroughly disliked by many of us. It was replaced by an adjustable trigger with a clean, crisp release and minimum backlash that may well have been inspired by Remington's fine prewar Model 37 smallbore target rifle's trigger mechanism. To go with it, there was a thumb-operated, side-mounted safety which, together with a low bolt handle, allowed a scope to be mounted low and centrally over the receiver.

Notice, too, this rifle's precedent-setting round receiver which, along with its blind magazine and stamped trigger guard/floorplate, indicated an obvious intention to cut production costs. Back then, before investment casting was invented, those were the ways costs were reduced. While we learned to live with it, I confess to a profound dislike for sheet metal stampings and blind magazines.

The round receiver, on the other hand, has been adopted as advantageous, at least in the eyes of most benchresters, because of the superior bedding possibilities it offers. It also served to reduce weight. Model 721 rifles in .30-06 caliber tipped the scales at only 7¼ pounds, with the shorter-actioned Model 722 running an even 7 pounds. That was considered light in those days.

Original chamberings were .30-06, .270 Winchester and .300 H&H Magnum in the Model 721, with a further choice of .257 Roberts or .300 Savage in the Model 722. Magazine capacities were four cartridges except for the .300 Magnum which held only three. Barrel lengths were 24 inches, with the exception of the .300 Magnum which had a 26-inch barrel.

In 1950, the newly developed .222 Remington cartridge was added to Model 722 chamberings, followed about 1955 by the .244 Remington and .308 Winchester. The last caliber to be added, around 1959, was the .222 Remington Magnum. Of the four later additions, all except the .308 were given 26-inch barrels. The .308's was 24 inches long. Magazine capacity was five rounds in .222 and .222 Magnum; four rounds in .244 and .308.

Standard grades were identified by the suffix "A" (as in 721-A and 722-A). Additionally, Remington offered an AC-grade that was the same as the standard except for checkering; also, a B Grade (Special) in which a better grade of walnut was used. Checkering was also included. For the well-heeled, there were D (Peerless) and F (Premier) grades at substantially higher costs.



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The Model 722 enjoyed the distinction of being the first short-actioned American factory bolt rifle since the days of the Savage Model 1920.

At various times, I've owned and used three of those rifles, all Model 722's. The first was in .300 Savage. That one proved to be one of the least accurate factory rifles I've ever had the misfortune to own. I never found out why and before long, traded it off.

Next, I purchased a .244 Remington, one of those famous for their too-slow rifling twist. That rifle would make five-shot groups well under one MOA with either 80-grain Remington Power-Lokt HP factory rounds, or handloads built around the same bullets. That agreed with press reports of the time but, said the shooting journals, I shouldn't expect anything in the way of accuracy if bullets of over 90 grains were used. It was claimed that 100-grain bullets wouldn't stabilize in the 12-inch twist.

Of course, I had to try it. Maybe that particular rifle had never heard it wasn't supposed to shoot heavier bullets. At any rate, I found it would group 100-grain Norma loads from 1 to 1 1/4 inches, and Remington 100-grain fodder in 1 1/4 inches at 100 yards. Then I remembered that it is bullet length rather than weight which is subject to twist restrictions and made up some handloads using 105-grain Speer round-noses which were short for their weight. The rifle responded with 3/4-inch groups! It was quite true however, that long 100-grain spitzers were unstable in that barrel, but I couldn't see any evidence that 90-grain bullets wouldn't do anything a 100-grain would.

Last, and best, of my Model 722 rifles was one in .222 Remington Magnum caliber. With its stiff barrel, that rifle can be absolutely depended on to shoot five-shot groups from 1/4 to 3/4-inch, and do it with a wide variety of loads. It has proved to be one of my most accurate and dependable varmint rifles.

The 721 and 722 series were strong, safe and serviceable rifles. Accuracy varied with individual guns. The principal faults I found with them were: (1) The thin spring extractor which eventually broke off in the .244 and had to be replaced at the factory, and (2) that blind magazine with its fixed, sheet metal floorplate and trigger guard. They must have appeared incongruous indeed on one of the costly D or F-grade rifles!

They were the testing ground for the great Remington 700's that arrived with the 721 and 722's discontinuance in 1962. As such, they served their purpose well. That they are still in demand at secondhand gun shops says something about their overall reputation.

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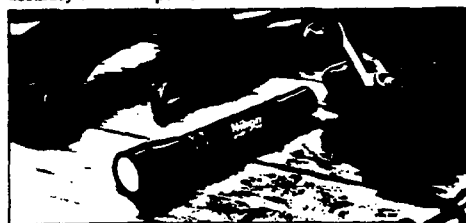
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**Shilen: The Man  
and His Rifles**

## Shooting the Kalashnikov

(Continued from page 31)

69-grain Sierra match bullets are not recommended for use in twists slower than 10 inches. On the other hand, M193 ball shoots as well in the seven-inch M16A2 twist as it does in the 12-inch twist M16A1 barrel.

Ammunition supply is no problem. There are plenty of 5.56mm NATO and .223 Remington components around. PMC, CBC, Norma, Sako and Midway all make Boxer-primed 7.62x39mm brass. Berdan-primed, non-reloadable 7.62mm ammunition is also widely available. Case-lot quantities of fresh Chinese, Yugoslav and other 7.62x39mm hardball cost less than the components needed to reload the same number of rounds. For hot loads expected to be dented on ejection, or for use in deep brush or snow conditions where brass recovery is a nuisance, many here shoot the non-reloadable ammunition. They pull the bullets from as many rounds as

may be required for hunting, substituting softnosed bullets and commercial powder and never bother searching for fired brass.

The handloads listed in the accompanying tables were chronographed in the 19-inch AKs. They are uncorrected, measured approximately 15 feet from the muzzles. Ambient temperature averaged about 60 degrees Fahrenheit. Many of the loads exceed those listed in various reloading manuals. Successful use of the hotter loads can be attributed to the often larger-capacity, stronger military brass (some made of steel) in which the loads were developed. The long military throats of the rifles and their oversized, hence pressure-relieving, groove diameters also helped.

Anyone developing loads for his own AK or Mini-Thirty should first mike his barrel's groove diameters and start 10 percent under the reloading manuals' recommended maximum, working up slowly and watching for pressure indications.

Sako offered MOA-capable bolt action sporters in 7.62x39mm on the short Vixen action for years. Ruger now offers the Mini-Thirty in the caliber as a short-range deer and black bear chambering. Mini-Thirty factory acceptance accuracy proof requires two-inch grouping ability at 50 yards using iron sights.

In one test, three, five-shot groups, each out of five different Mini-Thirties with four different kinds of ammunition (300 rounds total), fired with a 6x scope at 50 yards, averaged 2.07 inches. The tightest three-group average was 1.43 inches. The Mini-Thirty chamber and throat are cut to short commercial rather than long military dimensions and the groove diameter is .308 inch. The pressure effect of firing .310-inch diameter steel-jacketed and steel-cored military ball in a Mini-Thirty is unstated.

The 7.62x39mm cartridge, upon which the .220 Russian and 6mm PPC benchrest cartridges are also based, operates at 47,000 psi nominal breech pressure. Sako sporting ammunition in the caliber is listed at that pressure level in Sako literature. Factory proof pressure is 70,000 psi.

Among the Kalashnikov's legendary merits are its massive front locking lugs which make the action virtually indestructible. Similarly legendary is the AK's functional reliability under adverse operating conditions.

Both overload strength and underload functional reliability were tested. The cross-sectional areas of the 7.62mm and 5.56mm case heads are .157 and .110 square inch respectively. At 50,000 psi breech pressure, each of the AK's lock-

64979

## Important Notice To Recent Buyers Of Remington Bolt Action Rifles.

Remington Arms centerfire rifle Models 700, Seven, 40-XB, 40-XC and Sportsman 78 manufactured between July 29 and December 11, 1987, have been withdrawn from sale temporarily for replacement of trigger assembly mechanisms.

This action was taken because a limited number of rifles produced during that period may have an improperly manufactured part in the trigger assembly mechanism. Although it is unlikely, the defective part could break and cause the rifle to fire accidentally.

Remington Arms has launched a program to identify and recover all rifles made and sold during this period, and as a precaution, will replace the trigger assembly on every affected rifle without charge to the owner.

All Remington trade customers and individual rifle owners are being notified, and it is expected that this program will quickly identify owners of the affected rifles.

This notice applies only to those bolt action models listed. No other Remington firearms are involved.

If You Have Purchased One Of These Rifles Since July 29, 1987, Do Not Load It.

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MAY-JUNE 1988

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July 1, 1988 Sports Afield page 12

## Important Notice To Recent Buyers Of Remington Bolt Action Rifles.

Remington Arms centerfire rifle Models 700, Seven, 40-XB, 40-XC and Sportsman 78 manufactured between July 29 and December 11, 1987, have been withdrawn from sale temporarily for replacement of trigger assembly mechanisms.

This action was taken because a limited number of rifles produced during that period may have an improperly manufactured part in the trigger assembly mechanism. Although it is unlikely, the defective part could break and cause the rifle to fire accidentally.

Remington Arms has launched a program to identify and recover all rifles made and sold during this period, and as a precaution, will replace the trigger assembly on every affected rifle without charge to the owner.

All Remington trade customers and individual rifle owners are being notified, and it is expected that this program will quickly identify owners of the affected rifles.


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**Remington** 

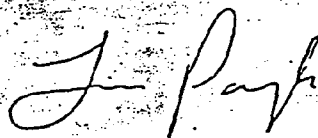
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# ADVENTURES IN EDITING

TOM PAUGH

## GRESHAM ON ETHICS

In July much of the world has hung out its "Gone Fishin'" sign to retreat to the lakes, ponds, rivers and salt water. But if you're a serious hunter this is the month when you begin to feel those first stirrings that tell you the season is fast approaching; there are plans to be made, equipment to be purchased and made ready. Now is an excellent time for all of us to reexamine our hunting motives and ethics, and who better to lead us in this self-exploration than Sports Afield's Shooting Editor Grits Gresham. That is why I have turned this month's column over to him. Please read it . . . and take heed.



### OUTDOOR ETHICS: WHERE IS IT HIDING?

For more decades than I really care to remember I've been writing about the outdoors, especially about hunting and fishing. During those 30-plus years I've witnessed a dizzying number of instances of actual game and fish law violations, and many more occasions where there was a seeming total lack of respect for the game or the fish involved. I've heard about a lot more.

"Those slob hunters really give us a bad name. They're a small minority, but they're the few we've got to straighten out."

Does that line sound familiar? You've heard it before? You've parroted it before? Sure, so have I. For a long time I believed it. Then the doubt began to creep in, and now I've about come to the conclusion that you and I have been led down the garden path.

I'm not at all sure that slob hunters don't constitute a sizable segment of all who go afield each fall with gun in hand!

If that be heresy, make the most of it.

You say I'm giving the anti-hunters ammunition? That's debatable. Their most effective ammunition comes from "sportsmen" who don't operate ethically, who don't observe the laws and regulations, who don't treat game and fish with the respect each individual deserves.

Sports Afield has been around for a full century, and has been a leader on behalf of the wise and ethical use of our outdoor resources. For many years the Sports Afield conservation column, written by the late Mike Hudoba, made a lasting impression on me as well as on millions of readers around the country. Over the past few decades many of us have written features and columns in this magazine about conservation, about the wise use of natural resources, and about sportsmanship. We've deplored unsportsmanlike conduct, illegal activities, and other breaches of the responsibilities of good citizens.

But have we done all we could have or should have?

I don't think so. I do think we've been somewhat mesmerized by the tale of "successful game management," following a fictitious trail of the role of the hunter in bringing many game species back from the brink of extirpation to a status of abundance. Not that the contribution of huge sums of money for conservation—by hunters and shooters—doesn't deserve some applause. Patting ourselves on the back can be effective in countering the caterwauling of anti-hunter activists who contribute little or nothing to the well-being of wildlife.

Sports Afield, despite being a leader on behalf of conservation for a century, hasn't done enough, but we're going to do more. The truth is that we much prefer to put on a happy face, displaying in our spectacular pages the feeling that all's right with the outdoor world. Hey, man, that's good for business. It makes everybody feel good. It portrays the living truth that this nation is the consummate arena for hunters and fishermen, for those of us who dearly love the outdoors. And I think we portray that better than has ever been done before.

But, starting now, we also hope to integrate into our pages an awareness that

(Continued on page 103)

Sports Afield July 1988

American Hunter

May, 1988



## Remington Recalls Some Bolt Rifles

Remington Arms Company has announced a recall of a number of bolt-action centerfire rifles sold after July 29, 1987. According to Remington, they may contain a defective part in the trigger assembly that could cause the rifle to accidentally fire if it breaks. The company says that while the possibility of a malfunction is unlikely, it will replace the complete trigger assembly at no cost on all affected rifles, to include the following models manufactured between July 29 and December 11, 1987: all versions of the Model 700, Model Seven, Sportsman 78, Model 40-XB, and Model 40-XC.

All persons who have one of these rifles are urged not to load it and to call toll free (800) 634-2459 with the serial number of their rifle. At that time it will be determined if it is one of the recall guns. If so, Remington will direct the owner to a designated repair gunsmith who will install the replacement trigger assembly at no charge.



Currently retailing for about \$270, Remington's M788 is an excellent value and the .222 Remington is a fine choice for target, varmits.

By Dean A. Grennell

## REMINGTON'S MODEL 788 — IN .222 REM AGAIN!

A NICE LITTLE CARTRIDGE  
IN A NICE LITTLE RIFLE —  
WHAT'S WRONG WITH THAT?

THERE IS SOMETHING to be said for a competent rifle at a comfortable price and the canny crew at Bridgeport (Connecticut) would be among the last to argue that point. That is of course one of the home bases of the Remington enterprises and we are on the verge of discussing Remington's Model 788 bolt-action rifle one more time. I'd hesitate to attempt tabulating all of the previous reviews of M788s in these pages, recalling at least one in .30-30 WCF and another in .44 Remington magnum. I believe another was reviewed in 6mm Remington and I worked with another in .22-250 Remington, later arranging for my brother Ralph to purchase it. He proved beyond the slightest doubt that it was a formidable downer of Wisconsin

whitetail deer with Speer's 70-grain bullet, delivering two clean, one-shot kills the first year his hunting party took it afield.

For my part, I still have a Model 788 in .44 Remington magnum and admire it intemperately. It carries a low-powered scope and it will cut one-hole groups at fifty yards with nearly any load you choose to feed it.

There is a large, rather loosely knit siblinehood of shooters who have dis-

covered the uncommon virtues of the M788, more or less independently. I have a friend in an eastern state with a fine two-hundred-yard range with sturdy shooting bench on his own property. Some years back he owned an M788 in .22-250 Remington that was uncommon, even by the high standards of the breed. It would sour his whole day if it went over one inch at two hundred yards.

As with any corporation concerned with the welfare of its stockholders, Remington tries to concentrate upon the products that move well, occasionally dropping those that do not. Thus, the M788 in .30-30 WCF was an early casualty — despite the fact that the one I tried performed right nobly — and so (sigh!) was the one in .44 Remington magnum. I'm glad I've got mine and I feel sincere sorrow for any shooter who lacks one.

Now and ever again, they hold a staff meeting in Bridgeport or wherever and come up with a decision to reinstate some given caliber back into the offering for the Model 788.

Thus it came to pass, some few months back, that the word came down to watch for some M788s in the .222 Remington persuasion once again.

Now you have to realize that the .222 Rem, or Triple-Deuce, has been my own personal, elusive will o' the wisp for a goodly portion of my shooting career. When it first appeared, any number of shooting buddies bought guns for the .222 and had nothing but gosh-wow results with it. Along the way I've tried several rifles in .222 Rem and have gotten one solid bit of data drawn to date. There is no special intrinsic magic in the



With Bushnell spotting scope he, Bill Grennell tries out his first batches of reloads off the portable shooting bench. The scope is Weaver's Target Model T-6 on Weaver mounts and rings. It has adjustable objective and uncovered knobs.

.222 Rem cartridge. Any number of guns chambered for it can and — for me — do perform at levels hardly as high as mediocre.

A couple of decades upstream, I recall similar frustrations with the .222 Remington magnum cartridge. Out of that one I got one 1¼-inch group at one hundred yards and an endless infinitude of groups considerably larger. Friend Midge Dandridge has a .222 Remington magnum that cuts nothing but cloverleaves — even with me firing it! So it goes.

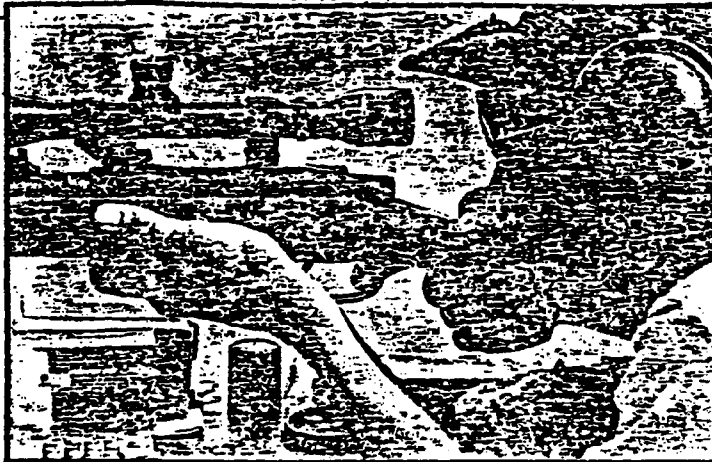
But hope springs more or less eternal and that strikes me as a good thing. When the word came down that Remington had resumed production of their Model 788 in .222 Remington, my first thought was, "Well, maybe, after all, who knows?"

**A** REINFORCING consideration was that the seventh and — hopefully! — last of our brood was nearing his sixteenth birthday and had been consuming cartridges put up by others for well over half his lifetime without ever having rejuvenated a round with his own hands. Several of his older siblings are markspersons of considerable caliber, but it occurred to me that I never really settled down and succeeded in patching the details for reloading over to any of them.

Yes, it looked as if William Wesley Grennell was a logical candidate for the cram-course in reloading and what more craftily suitable combo could be envisioned than a Remington Model 788 in .222 Remington calibration?

I suspect that mine is a situation shared by any number of GUN WORLD readers. It is often a simple matter to inculcate children and other youthful friends with the joys of shooting, but how to go on and implant the bug to make them savor the finer aspects of reloading? If all this rings any kind of bell, you're ever so welcome to tag along and use the *modus operandi* as your own.

Ideally, the neophyte should be gifted with a press and set of dies all his/her own. That was fairly simple in Bill's case since I merely presented him with a



With mild cartridges such as the .222 Remington, a thumb across the pistol grip is permissible, but it can result in nosebleeds with heavy-kicking loads.

Lee turret press fitted out with my set of dies for reloading the .222 Rem. Truth to confess I've never to date owned a full set of .222 Rem dies. I have an RCBS .222 Rem sizing die and I use the seating die from my RCBS .221 Fire Ball set to seat the bullets. It works just fine.

I showed him how to apply the sizing lube to the cases beforehand, and how to get the goop off the cases after that step, emphasizing the need for both steps. I showed him how to sort by headstamp so that any five-round batch would go forth from a reasonably identical batch of cases. I showed him how to seat the primers — we were using the Remington 7½ small rifle type — and how a sensitive fingertip passed across the head could verify the requisite flushness of seating.

I showed him how to set up and fiddle with the adjustable powder measure — the usual RCBS Uniflow familiar to faithful readers — to get the charge weights down to a dead-level average for ten drops into the pan of the scale. For the considerable bulk of our test rounds we were operating with 24.1 grains of Hodgdon BL-C2 powder, putting bullet after bullet ahead of that charge. It is a fairly universal charge working well with near-

ly all the suitable weights of bullets.

Flat-base bullets going into bottlenecked cases can sometimes snag and ruin the necks in seating. I showed Bill how to taper-ream the case mouths to prevent such catastrophes, using the .224-inch reamer in the Forster Brothers case trimmer.

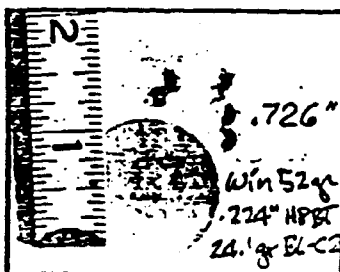
I then turned him fairly loose, with occasional hawkly monitoring, making certain that he retained meticulous records of load data keyed to positions of the test batches in the MTM cartridge boxes.

For reasons too ramified to chronicle, the first reloading session took place some few months prior to the shoot-out. The rather fugitive ink used in the original records had nearly faded to indecipherability by the time it came up for testing, but not quite, thank goodness.

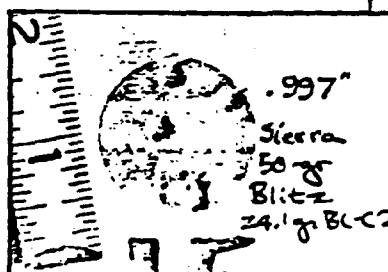
At the last moments I made up a few more test loads, using W-W 748 powder, highly recommended by friend Terry Tussey, who is a .222 Rem buff of many years' standing. I used the RCBS Little Dandy powder measure, principally because it drops from a fixed rotor so that charges today are pretty closely identical to charges tomorrow and tomorrows endlessly to come.



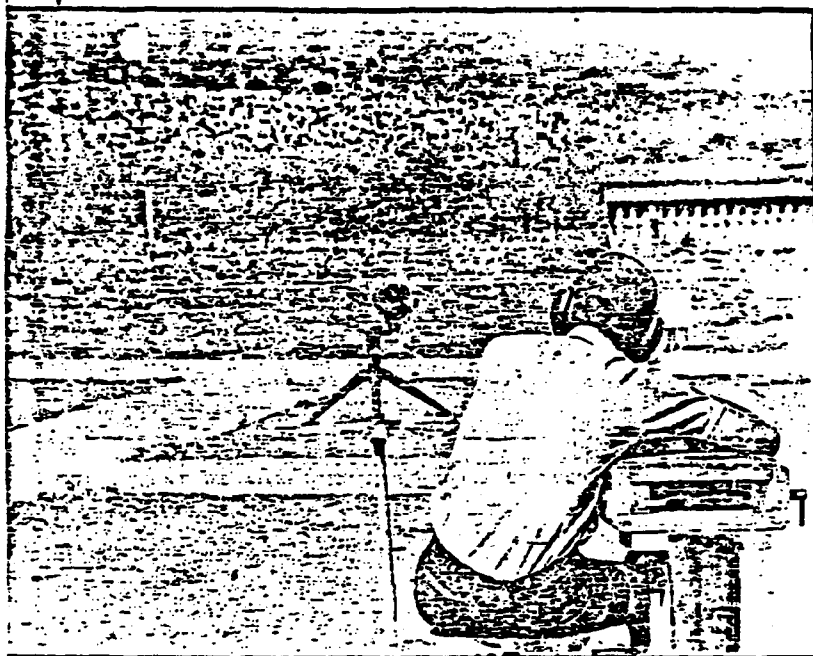
Three into one hole and all five in less than ¼-inch, this was the best group with reloads for session.



A 52-grain hollow point boat tail by Winchester printed this group. Charge was 24.1 grains BL-C2.



All five neatly inside the 1¼-inch aiming circle is gratifying to a new shooter, even if they sprawl.



Paper on portable target frame is 17x23 inches, holding a dozen of the day-glo red aiming pasters to minimize the hiking back and forth between test groups.

The #26 Little Dandy rotor — largest of the several numbers available — happens to drop 24.3 grains of 748 in the example at hand. Other Little Dandy #26s can and may vary somewhat from that figure. As with any fixed-rotor measure, the actual charge weight must be verified on an accurate powder scale.

**T**HE CHARGE of 24.3 grains of Winchester-Western 748 powder brings the level up to the bottom of the .222 Rem case neck or a trifle higher. As such, it is a convenient charge for ease of loading. The #10 Speer Manual lists 24.0 grains as the maximum charge of 748 for use with their 70-grain semispitzer. The #3 Sierra Manual shows 23.6 grains of 748 as maximum for their 63-grain semi-pointed bullet and Hornady's #3 Handbook gives 25.9 grains of 748 as maximum for their 60-grain spire point bullet. Thus, with the #26 Little Dandy rotor, you're equipped to throw suitable charges for any bullet up to and including the 60-grain Hornady — assuming of course that the #26 rotor in question doesn't throw more than 24.3 grains!

For the lighter bullets, 24.3 grains of 748 is well down the scale, but by no means so pooppy it won't get the bullet out the muzzle. As I commented to Bill, it is fairly common to find the milder loads giving the finest groups and the foot-pounds of energy (fpe) aren't all that important when you're only punching holes in paper.

In much the same manner the 24.1-

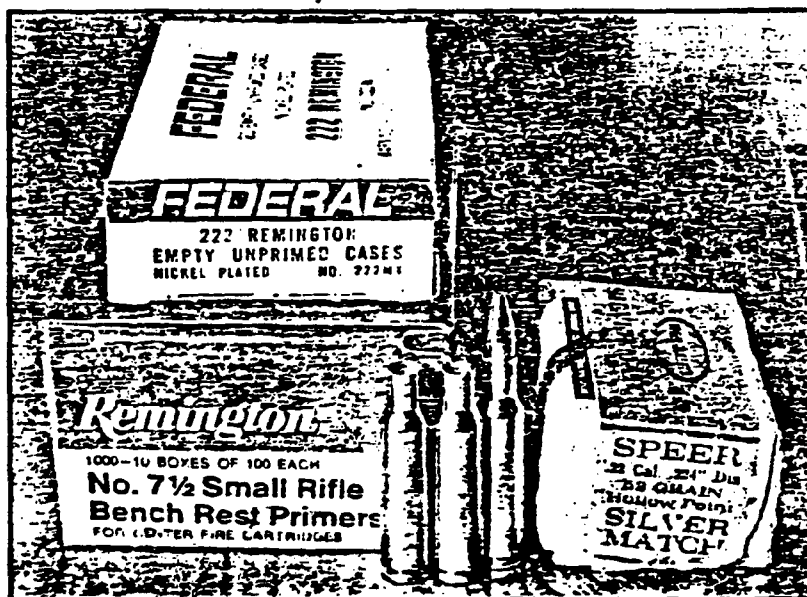
grain charge of Hodgdon's BL-C2 powder is comfortably below maximum listings for the .222 Rem in bullet weights up through 55 grains — 24.5 grains is Hornady's maximum for their 60-grain bullet and 24.0 grains is Speer's max-

imum for their 70-grain bullet, the same as Sierra's maximum for their 63-grain number.

If you wondered, the motive behind assigning a reloading setup to the fledgling is to keep them from getting into your own paraphernalia when you're not around. That could result in several pecks of problems.

Bill shares my sincere appreciation for scope sights on rifles and the glassware we selected for his M788 was Weaver's Model T-6 with Dual-X reticle, held in place with Weaver mounts and rings. Initially, we'd used a set of see-through rings, hoping to be able to fire comparison groups with both open iron and optical sights. It did not work out on this particular rifle. You couldn't quite get a view over the iron sights and it put the scope a trifle too high for comfort. Even so, on the first run to the range, Bill managed to dot off a few groups comfortably below one minute of angle (MOA), using some Remington factory loads that the thoughtful Dick Dietz had supplied with the rifle. We agreed that that was immensely reassuring.

For the second session, to wring out Bill's reloads, I replaced the see-through rings with a set of Weaver high rings, an extended type up front to enable the generous objective bell to clear the iron rear sight with a bit of room to spare. Arriving at the range, I used up some of the remaining supply of factory fodder to get the scope back to point of impact and then turned Bill loose to see what he

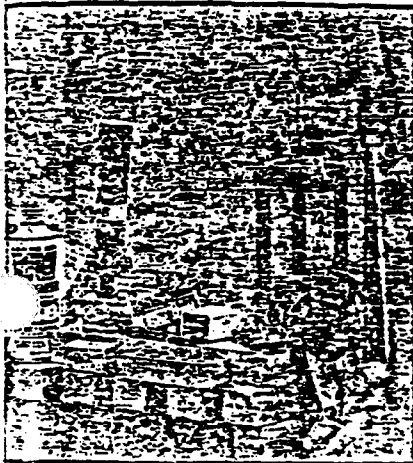


A well-aged box of Speer's nickel-plated Silver Match bullets put up in the nicked cases from Federal makes for remarkably handsome cartridges.

could do with his series of test loads.

We had started with a few loads carrying 40-grain jacketed bullets and it was to become apparent that the rifle at hand prefers slightly heavier projectiles. All of the charges are 24.1 grains of Hodgdon BL-C2 unless otherwise noted. Sierra's 40-grain, .224-inch Hornet went 1.455 inches and a second run with the same bullet printed 1.518 inches; all quoted group sizes are measured from center to center.

Moving up in weight, Sierra's 45-grain, .224-inch Hornet clustered to .920-inch for the first group, comfortably tight-



Lee Precision turret press and RCBS Little Dandy measure worked well for reloading while at the range.

er than one MOA. One MOA at one hundred yards is a thin trifle smaller than 1.05 inches.

**S**IERRA offers a vast profusion of bullets for .22 center-fire rifles. The type they designate as Hornet has a slightly thinner jacket to assure expansion at the lower velocities. Five rounds with the non-Hornet 45-grain Sierra bullet printed into a spread of .952-inch. Another five, using the Sierra 45-grain semi-pointed went into 1.113 inches.

Moving up in weight, still with the 24.1 grains of BL-C2, Sierra's 50-grain .224-inch spitzer bullet knuckled down to .612-inch, with three of those holes nearly in the same place. The Sierra 50-grain Blitz did almost as well, with a spread of .997-inch and all five of those holes were solidly inside the 1.25-inch aiming circle, to Bill's manifest delight.

We had two five-shot groups at that point with identical load data, carrying the .224-inch Winchester hollow-point boat-tail bullet. The first went into 1.273 inches and the second dotted in a .726-inch cluster. A final fusillade with the BL-C2 charge behind Sierra's 52-grain

*Continued on page 48*

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## REMINGTON MODEL .222 Continued from page 47

hollow-point Benchrest bullet went into .971-inch of spread.

We had packed along a Lee Turret press, mounted to a handy small hunk of two-inch plank, securing it to a nearby gun rack with a C-clamp. I used it to make up a few test batches with the 24.3 grains of 748 powder and, topped off with some of Speer's old 52-grain Silver match hollow points. Bill drilled those into a group that spanned .810-inch.

All in all it tended to restore my regard for the .222 Remington cartridge, and to reinforce my accumulating conviction that I may function better as a teacher than as a doer. Scanning all the nice clannish groups, I could see that Bill was beginning to think that it was all pretty easy and simple, likewise a lot of fun.

What he has yet to learn is that it isn't necessarily always quite that clearly-cut simple. Yes, it'd be great if only it were. Not all rifles give one groups nicely tighter than one MOA half the time. Some rifles can't do that well if the muzzle is pressed against the paper — take my sincere and rueful word on that!

A good beginning can be really great as it's going past. In that light, I recall the first round of trap I ever fired. I got twenty-three birds out of twenty-five, and haven't done quite that well in the thirty-nine years since that memorable occasion.

Putting it another way, when you get groups below 1/4-inch at one hundred yards on your first batch of reloads, it doesn't leave a lot of room for improve-



Hodgdon BL-C2 and Winchester 748 powders work well in .222 Remington case, as do others.

ment. Yes, it's encouraging as all get-out, but it makes for a dogged tough act to follow.

W.W. Grennell wishes to go on record as approving the M788 Remington in .222 Remington chambering. D.A. Grennell seconds the motion, with a footnote to the effect that the T-6 Weaver scope makes a highly satisfactory steering committee for it. For the money laid out, it's a pretty tough combo to top but, as I was just saying, what do you do for an encore? **EW**

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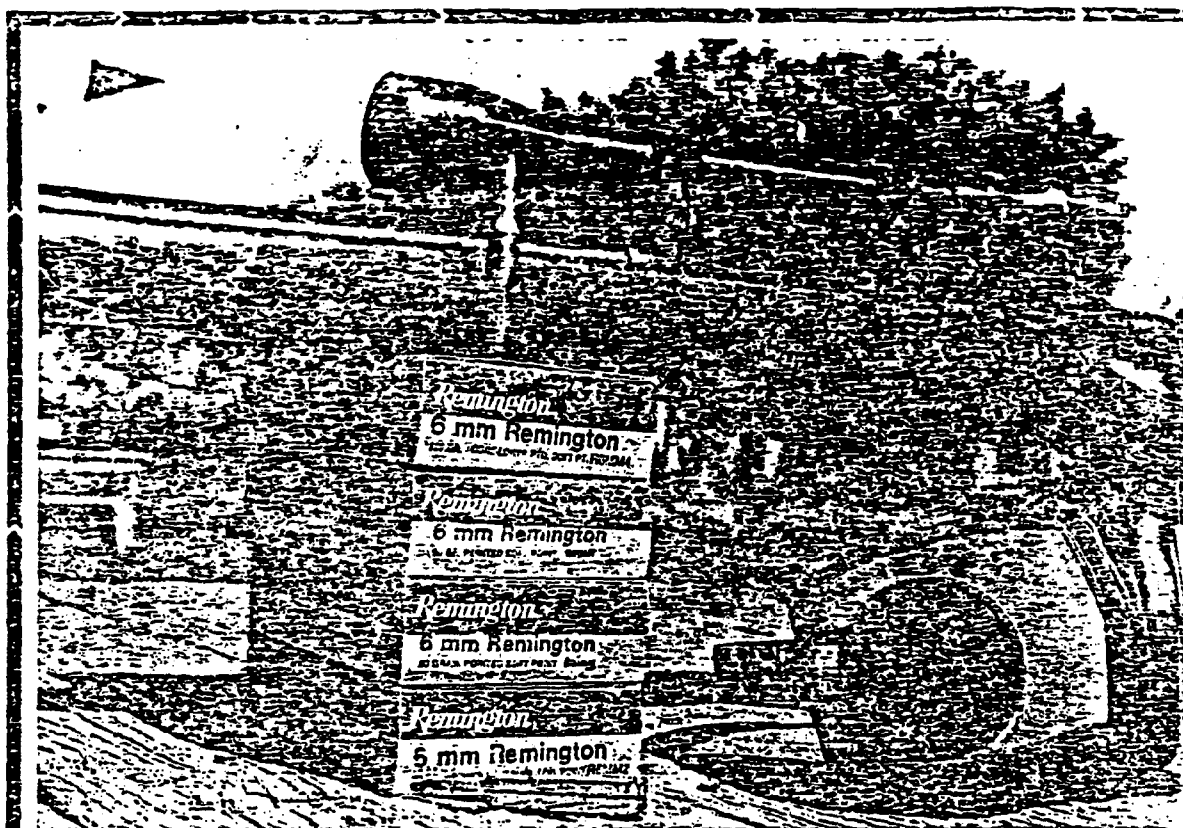
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Remington Model 788 in 6mm was extensively tested with four available factory loads. Each performed well.

## THE REMINGTON MODEL 788

By Roger Combs

AMERICAN FIREARMS manufacturers are still able to satisfy the market for an accurate, powerful, but reasonably-priced hunting rifle. A case in point is the Remington Model 788.

The Model 788 is as plain as plain can be — no frills, no checkering, no forend cap, no jeweled machining on any parts, no rubber recoil pad. What you get for the suggested retail price of \$159.95 is a smooth-functioning, accurate-shooting, high-power rifle that should hit anything within range that you can see.

The exposed metal parts are heavily and evenly blued, which on our sample has prevented corrosion despite some rather rough treatment. The stock is of an unknown hardwood with a walnut finish, smooth and pleasing to the eye and hand, with a Monte Carlo roll for the cheek. The gun is rugged looking and rugged acting. It is not a kissy gun. The bolt action is smooth and fast enough for most of us.

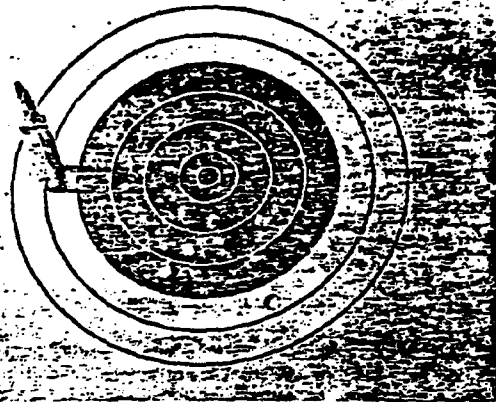
As it comes from the factory, the

Plain In Appearance, Inexpensive In Price, This Bolt-Action Can Satisfy The Average Shooter

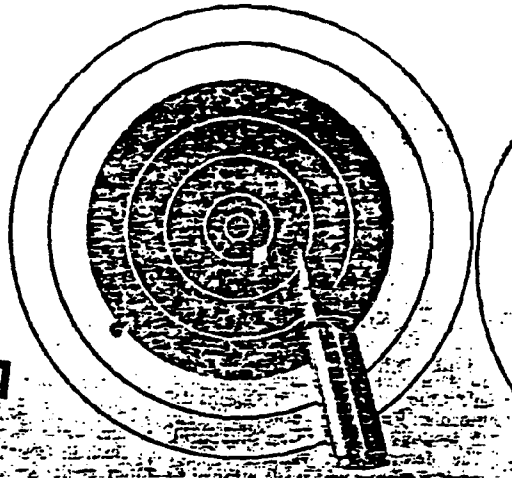
Author conducted tests at Oceanside-Carlsbad Sportsman's Club.



# NATIONAL RIFLE ASSOCIATION ICIAL 50-YARD SMALL BORE RIFLE TARGET



Eighty-grain soft point produced 1-5/8" test group.



Hollow point of 80 grains enlarged group size to 2"

open rear sight is adjustable for windage and elevation and the blade ramp front sight is removable. The receiver is drilled and tapped for scope mounts.

The rifle originally was introduced by Remington in 1967, five years after the perhaps more famous and more expensive Model 700. Incidentally, the Model 788 is available on order complete with 4X scope for a listed price of \$184.95. For lefthanders, the gun may be had for \$164.95, but in 6mm and .308 Winchester only.

The big question for any firearm is, can it shoot? Will it hit what it's aimed at? The answer is a definite yes. I fired what I consider a goodly number of rounds - about a hundred - through the twenty-two-inch barrel and found the accuracy to be well within acceptable limits for deer, wild pig or other reasonably big-game hunting. Not only that, but the Model 788, at least in the 6mm Remington we tested, is suitable for varmints and such small game as rabbits. We were able to prove that theory in the Southern California

desert not too long ago.

I also did some rifle range, paper target testing, using the four bullets put out by Remington for the 6mm: 80-grain soft point, 80-grain hollow point, 90-grain soft point and 100-grain soft point. These are the standard factory loads and should offer a range of bullet weights sufficient to handle a large percentage of the hunting available to most of us.

Before we get to the results of the range tests, perhaps a few more words are in order about the various features of this rifle. In addition to the 6mm version of the Model 788, Remington makes it available in .222 Rem, .22-250 Rem, .223 Rem, .243 Winchester and .308 Win. With that kind of lineup, there should be a Model 788 for most of us.

The rifle has a removable magazine that makes loading and unloading simple and easy. The 6mm magazine holds three rounds and the shooter can carry another round in the chamber. The magazine unlocking button is located

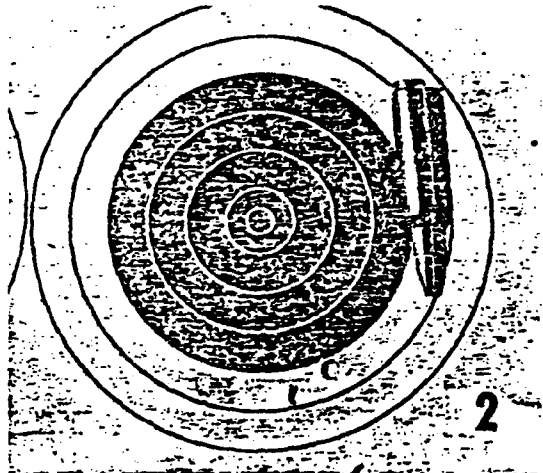
just to the rear of the magazine and functioned without any hitch during testing and firing. Our test gun has an overall length of 42 inches and weighs, out of the box, about 7 1/4 pounds.

For our purposes we did not attach sling mounts and a sling, but for the average shooter, I would think such an addition would be most beneficial.

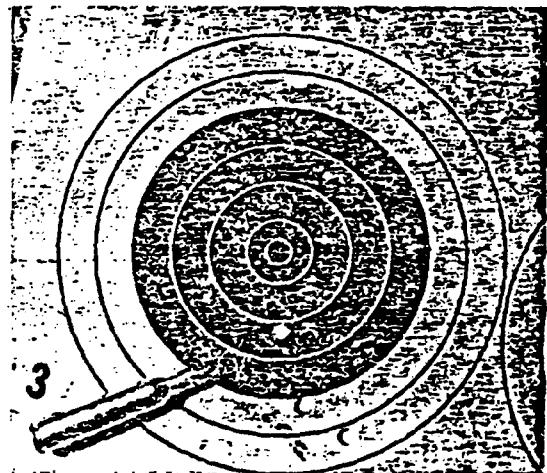
Remington's catalog lists the 6mm M-788 as having right-hand rifling with a complete twist each nine inches, the same as the .243 Win. The .222 Rem and .22-250 show barrel lengths of twenty-four inches each with a turn every fourteen inches. The .223 Rem also has a twenty-four-inch barrel, but a turn in the rifling each twelve inches. For the .308 Win model, the barrel is twenty-two inches long, same as our 6mm, and a turn of the rifling each ten inches.

A thumb safety is located on the right side of the receiver and operating it caused me no problem as I settled down to my test shooting. Ejection is to the right, and after a few rounds I

Best group was 1-3/8", using 90-grain soft point.



One hundred-grain group size matched 80-grain soft point.





found I could control the toss of the brass rather well to eliminate the necessity of retrieving the spent cartridges from the ground below the bench.

If the gun were mine, I would have a competent gunsmith lighten and shorten the trigger pull a bit. It isn't bad for a factory product, but it was a bit more than my trigger finger is used to and prefers. I couldn't help comparing it with my personal Remington .243 Model 600 Mohawk, which I've shot for several years and which requires a lighter touch to set off.

Because of the exigencies of the publishing business, we took the M-788 to the desert for rabbit hunting before we were able to schedule some time at the Oceanside-Carlsbad Sportsman's Club rifle range in Oceanside, California. From my point of view, both sessions proved to be successful.

The desert hunt yielded a half-dozen jackrabbits which succumbed to the 80-grain soft-point ammunition. We were able to pick a couple of the long-eared off at up to two-hundred yards with fine accuracy. I had sighted in the rifle at a hundred yards and found that the bullets still were within the target zone at the additional range.

Most of the time those desert jacks don't sit still for the hunter to show off with a nice long shot from a careful position resting on rock or knee. Usually the bouncers will jump just in front of you and take off across the sage and sand at an erratic and unpredictable pace and path. Most of us need more than a single shot to bag that kind of game and the 6mm proved fast and smooth enough to allow two and sometimes three tries at the elusive little critters. Firing, opening the bolt, shoving the bolt forward carrying a new round into the chamber and triggering that second shot proved fast enough for each of the four hunters who tried out the gun over that weekend hunt.

Our method of hunting rabbits in the Southern California desert is generally simple and straightforward. Normally, there is a group of two to five or six hunters who get together on a weekend hunt. None of us regulars live in the desert, so the drive to rabbit country is from three to five hours. Because of the distance we try to make a whole weekend of it.

After establishing camp, and depending upon the time of day, we'll usually spend an hour or two scouting the terrain. Most of our hunts are through rugged country strewn with boulders, sagebrush and just plain sand. There are plenty of washes and hills, which give jackrabbits plenty of hiding places. Sometimes, most of the game is found down in the washes and valleys near what little feed there may be, while at other locations we'll see dozens along the ridgelines. This gives us long shots and short running shots to practice.

Once we've found what we hope will be a productive area, we'll line up abreast about forty or fifty feet apart and start moving across the desert. It is important for safety reasons that each hunter maintain a more or less even

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Three-round magazine is easy to load, functioned flawlessly during testing.

line while moving. Rabbits often will flush in front of one hunter and run at an angle across the front of two or three others. We each establish ourselves with an approximate sixty degree fan outside of which we must not shoot.

This kind of hunting requires a fast-handling, fairly lightweight, smoothly operating rifle if the hunter is to have any success. As the rabbits always seem to be "just over the next ridge," a sling for this kind of hunting would be more of a hindrance than a help. One must be ready to fire at all times and any lack of concentration or preparedness will result in missed opportunities.

Length of pull of the Remington stock — distance measured from the trigger back to the center of the stock butt — is listed as thirteen and five-eighths inches and that felt good to me during the fast action required hunting rabbits. I was able to snap the rifle up to my shoulder, find the target through the scope, thumb the safety and get off a shot or shots without any snags. With that kind of shooting, the

absence of any sort of checkering on the stock is not noticed.

As mentioned earlier, the range testing utilized the four Remington factory rounds available for the 6mm. Not having a chronograph available at the time of testing, the muzzle velocity figures used are based on extrapolation.

Raymond Combs offers proof that Remington M-788 in 6mm is able to take desert jackrabbits.



Gallant Publishing's Jack Mitchell assisted during sighting-in process.





tions from the numbers published by Remington in their ballistic charts. (Incidentally, the charts are printed in the company's catalog that is available free of charge from Remington Arms Company, Dept. GW, Bridgeport, Connecticut 06602, should your local retail dealer not have a supply. The charts make interesting reading and are worth studying.)

I set up the standard NRA fifty-yard small-bore rifle target at a hundred yards and cranked the Weaver 2.5X7 variable-power scope to the maximum of seven. Using a couple of sandbags on which to rest the forend, I carefully fired three rounds of each factory load through the Model 788. I held the scope crosshairs at the center of the black each time.

The ballistics charts show the 80-grain soft-point bullet leaving the twenty-two-inch barrel at 3410 fps. My group measured 1-5/8 inches from center to center and printed at about six o'clock, roughly two inches below the X ring. Changing to the 80-grain hollow point, the group measured exactly two inches across but was centered at about seven o'clock, again about two inches from the center of the bull — although one round cut the ten ring. Remington's ballistic figures show the two 80-grainers as having the same velocity.

Moving on to the 90-grain soft point, my group shifted slightly to the right of the bull, about 2 1/4 inches from the center and hanging out at about five o'clock. The three-shot group measured a bit tighter, at 1-3/8 inches across. That group proved to be the tightest of the day with any weight bullet.

Muzzle velocity of the 90-grain bullet is listed at 3200 fps, 210 fps less than the 10-grain lighter bullets.

Finally, the 100-grain soft point printed a group at about the same location as the 90-grain in relation to the X ring, with a distance of 1-5/8 inches across. Muzzle velocity for this round is listed at 3070 feet per second from the twenty-two-inch barrel.

We might summarize by saying that the two heavier bullets tended to print their groups slightly to the right of the aiming point. This could well be due to the lack of proficiency of the tester, but still places the hits within accepted vital areas for most North American game animals. I must mention, also, that my groups seemed to pattern with two shots near each other and the third hanging out. I would guess that this, too, was due to the shooter's shortcomings.

I am convinced that the Remington Model 788 offers today's buyer/shooter a genuine bargain in firearms. It is a good-shooting, hit-where-you-aim, reasonably-priced-in-the-modern-world bolt-action rifle. The model is offered in a sufficient variety of chamberings to satisfy most of the potential market and, of course, represents the quality reflected in the Remington name.

Meanwhile, I have placed my order for a can of group tightener, but it hasn't arrived as yet.

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# Remington's Model 7 the ultimate light rifle

PINCHER CREEK, Alberta — "You carry 'em more than you shoot 'em" has been the axiom habitually professed by hunters in their endless search for the ultimate lightweight hunting rifle. It looks as if this quest may be over.

At its 21st New Products Seminar here on the eastern slope of the Canadian Rockies, Remington Arms Co. officials unveiled their new Model Seven bolt action rifle — a carbine-type sporter weighing only 6¼ pounds and will be available in early 1983 in a variety of modern calibers that should satisfy the most demanding hunter seeking a lightweight, accurate and modern hunting rifle.

Remington officials also announced the development of several other new arms and ammunition products, but the Model Seven is deserving of more discussion.

The Model Seven is a sporting arm in every sense. It is a sleek, well-designed and well-made bolt-action, featuring an 18½-inch tapered barrel and a completely redesigned action. The action and barrel are further fitted to a straight-comb, American walnut stock with checkered forearm and pistol grip. The stock has a rubber butt plate and is finished in a new, medium satin gloss.

Of equal interest is that this lightweight hunting rifle balances superbly and is light enough to permit rapid handling. Indeed, it actually points like a scattergun. The Model Seven will be available in such calibers as the .222, .243, 6mm, .308 and the 7mm-08.

Remington officials claim the Model Seven is "one of the fastest handling, quickest pointing and most portable centerfire rifles ever offered to the sporting public." We surely agree with this statement.

In mid-1983, Remington also will

## Spurrier named Bandits' coach

TAMPA, Fla. (AP) — Steve Spurrier, the 1966 Heisman Trophy winner from Florida, was formally named head coach of the Tampa Bay Bandits of the United States Football League yesterday.

The announcement ended weeks of speculation that the 37-year-old former National Football League quarterback would resign as offensive coordinator at Duke University to take the professional job.

"He's the youngest head coach in pro football and the only Heisman Trophy winner in Florida," Bandits owner John Bassett said at a news conference attended by about 200 people.

Bassett, of Toronto, said Spurrier was signed to a three-year contract, but did not disclose the terms. He did say, however, that the agreement would not allow Spurrier to take another coaching job unless the Bandits refused to match the other offer.

## HUNTING AND FISHING

By HOWARD BRANT



offer the sporting public a Model 1100 autoloader shotgun called the Special Field. This scattergun features a 21-inch barrel and a straight-grip, English-style stock and has been conceived purely for the upland bird hunter seeking a lightning-fast handling smoothbore for use in the dense upland coverts.

The Special Field will be manufactured in the standard 12 gauge as well as in an LT-20 gauge lightweight version with a choice of ventilated-rib improved cylinder, modified or full-choke barrels.

Also new for 1983 will be the completely restyled Model 700 ADL rifle — the popular bolt-action which was initially introduced in 1962 by Remington. However, the redesigned model features a number of changes including a whole new stock and decorative finish. This basic, and still lowest-priced, Model 700 will be chambered for nine different calibers from the .222 through the 7mm Remington Magnum cartridges.

And adding to its Model 700 "Classic" rifle series, Remington will introduce, on a limited basis, the Classic version in the time-tested 300 H&H Magnum chambering for those sportsmen interested in the Classic calibers of yesteryear.

Also new in 1983 will be left-hand version of Remington's Model 1100 and 870 deer guns; a Model 870 (12 gauge) "Mississippi" Ducks Unlimited Commemorative; the Model 700 BDL chambered for the .223 Remington cartridge; a high-performance .357 "Maximum" handgun cartridge; and a 28-inch, modified barrel for its Model 1100 and 870 scatterguns chambered for the 20 gauge magnum hull.

Remington also anticipates producing several new shotshell loading in the new year, including its premier shotshells in three basic categories: Extended-Range Magnums, Extra-Long Range, and Power Pattern field loads. These loading will contain Copper-Lokt, a copper-plated shot, and have been designed to produce maximum patterns at all hunting ranges.

Remington will further expand its offering of buffered Nitro Magnum shotshell loadings — a shotshell featuring granular cushion material to produce uniform patterns at extreme yardage. The Nitro Magnum will be available in 14 new specific loads for both 12 and 20 gauge magnums.

Finally, Remington has developed a new one-ounce Peters target load for the competitive trap and skeet shooter — a load producing exceptionally light recoil. It was created to help eliminate fatigue and recoil flinching for the clay-bird gunner.

# HUNTING AND FISHING

By HOWARD BRANT



## Alberta area beautiful but game is scarce

**PINCHER CREEK, Alberta**—The Rocky Mountains along Alberta's westernmost border have always been judged as the most grandiose in the entire west and here amid the foothills of these magnificent snow-clad pinnacles in southwestern Alberta was the site selected by Remington Arms company to conduct its 21st New Product Seminar.

The seminar is annually staged by this all-American arms manufacturer at any number of sites in North America and it serves a twofold purpose—to introduce its new arms and ammunition products and further provides the opportunity to field test such products under actual hunting conditions.

The initial phase of this all-encompassing sojourn was a spectacular success, too, since Remington will introduce to the sporting public in 1983 a host of new and redesigned products including its all new featherweight bolt action hunting rifle which will most assuredly catch the eye of all big-game hunters. However, we were also here to hunt trophy whitetailed deer and that, indeed, is quite another story.

Alberta, Canada, is a long way for an Easterner to travel to hunt whitetails but in most recent years southwest Alberta has produced more Boone and Crockett Club "record class" buck whitetails than anywhere else in the North American continent. Nevertheless, as far as we're concerned, the "grass is not always greener" elsewhere nor is hunting often better on the "other side of the mountain."

Let us explain.

Alberta is the westernmost of Canada's so-called three prairie provinces and southern Alberta is practically treeless. However, Pincher Creek is situated in the eastern foothills of the Rockies which does sustain stands or woodlots of poplar and evergreens and it is in this farming region where whitetail bucks purportedly wax fat feeding on the lush greenery that is available in this foothill prairie country.

Now in all honesty we can't say we didn't see any huge bucks either, although all were mounted and observed hanging on the walls of local beaneries, lodges and private homes—we couldn't find anything that remotely resembled an antlered buck while actually engaged in hunting the surrounding countryside nor did many of the other writers attending the conclave.

For two days 32 hunters—including writers and Remington personnel—scoured the countryside and the total score was just two 8-point bucks. Now we're not saying that Alberta lacks game. Quite the contrary. The countryside abounds with a myriad of big-game animals. Moose were observed in abundance as well as mule deer, elk and, of course, whitetails. In addition, there is a substantial population of black bear and a few grizzlies in this country as well and if you stalk the nearby high country you may even catch an occasional glimpse of bighorn sheep or goat.

Our first morning afield here brought us close to a fine bullmoose supporting a prime set of antlers and during the remainder of the day we started some 20 mule deer and about 20 whitetails—but all lacked antlers. We encountered the same situation the following day, too. And to compound the calamity we happened to overhear two Indian women talking about the scarcity of antlered bucks during an early evening sojourn to a Pincher Creek general store.

What we're trying to say is that as far as we're concerned, the big-game hunters in the Tri-State woodlands of New Jersey, New York and Pennsylvania, will enjoy far better deer hunting and undoubtedly encounter far more deer than here in Alberta. Sure, if you want the opportunity to perchance tag a true trophy whitetail than possibly you should venture here.

But it is extremely costly to hunt in the western Canadian provinces. Our Alberta outfitter was Jimmy Simpson of Calgary, and his fee for a seven-day DEER ONLY hunt is \$2,500. In addition, an alien or non-resident whitetailed deer license runs another \$150 plus \$11 additional for an Alberta "Wildlife Certificate and Resource Development Stamp." Add to this the \$700 plus airfare from Newark and a weeklong Alberta whitetailed deer hunt surely costs a tidy sum—far more than you'd ever spend hunting deer anywhere in the East.

But in all due respects to this magnificent country and its professional outfitters, there is big-game here and if your forte is sheep, moose, elk, cougar or bear then we say yes, go west to Alberta (if you can afford the price tag). Actually, all western hunting is truly expensive. While many Garden State sportsmen habitually complain about increasing license fees in New Jersey, we should take a closer look at what it costs to hunt in the West. Our guide here in Pincher Creek is also a sheep outfitter and although big-horn sheep hunting is currently closed to aliens in this portion of Alberta, sheep can be hunted in northern Alberta. The price of such a hunt? Merely \$8,300 for 14 days! And that's in addition to a \$250 sheep permit.

### MSC beats Bloomfield

**LYCOMING, Pa.**—In a showdown between two New Jersey teams, Montclair State edged Bloomfield College, 51-46, for the Lycoming Tip-Off Tournament championship last night.

Montclair State (2-0) never trailed after taking a 26-23 halftime lead. Bob Smith of Bloomfield (1-1) led the scorers with 13 points.

**MONTCLAIR STATE—51**  
Coe 2-2, Durkin 2-1, Galsore 3-3, Genco 1-2, G. Hargis 0-0, Katch 4-1, Lowry 0-0, Mark 0-1, Schramm 1-0, Smith 2-2, Ziemba 3-3.  
Totals: 51-46

**BLOOMFIELD—46**  
Byfield 5-3, Castle 1-0, Herrmann 1-0, Renda 1-1, Taylor 0-1.  
Totals: 46-51  
Halftime: Montclair State 25-22

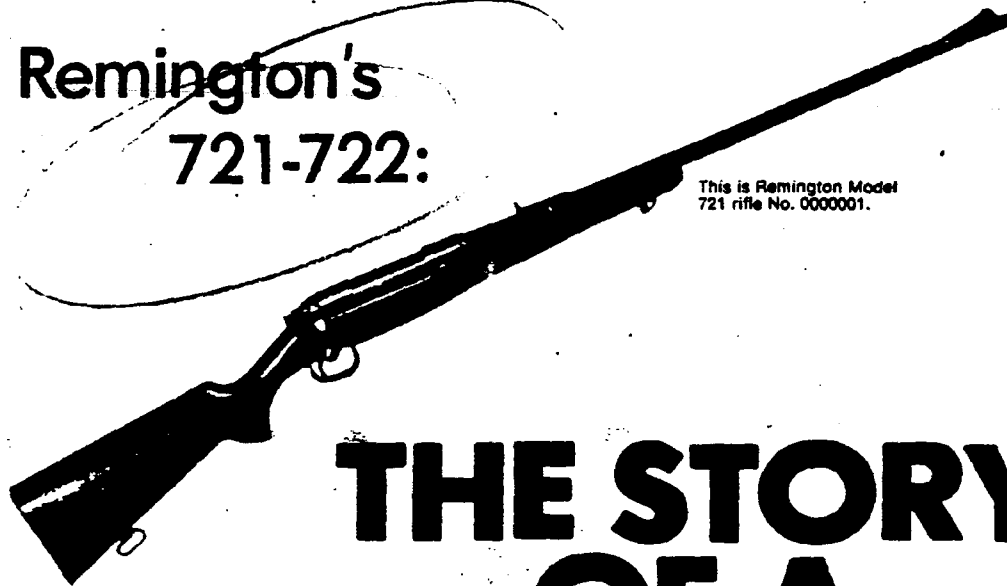
### Seton court party slated for Tuesday

Coach P.J. Carlesimo will be the focal point of the annual preseason party for Seton Hall men's basketball season ticket holders Tuesday at 7 p.m. in the Bishop Dougherty Student Center on the campus.

Due to the large demand for season tickets, party tickets, which go for \$10 each, will not be available at the door that evening. Food will be served and there will be an open bar at the affair.

The Pirates, who defeated Cibona of Yugoslavia, 70-66, in an exhibition last Saturday, will begin the regular season this coming Saturday against St. Anselm's at Walsh Auditorium at 8 p.m.

## Remington's 721-722:



This is Remington Model  
721 rifle No. 0000001.

# THE STORY OF A SUCCESS

by **STUART OTTESON**

REMINGTON today stands well out front as the leading maker of sporting long arms in the world. Their Model 700 bolt action enjoys the same position among high power rifles. It's been that way for so long we sometimes take it for granted.

Matters were once far different. Between the World Wars, Remington's gunmaking operations came perilously close to following the likes of Newton, Standard, Lefever, and Ross into the history books. Impressive physical facilities existed at Ilion, thanks largely to their World War I activities, but not many guns were being shipped, and those that were often as not sold at a loss to the factory. Remington kept going during those years mostly on profits from the cartridge division in Bridgeport.

When DuPont took over in 1933, Remington was running a poor third in gun sales behind Winchester and Savage. DuPont's Board of Directors

planned to close down the firearms end of the business, but as a matter of routine they first dispatched a team of DuPont engineers headed by a Mr. George Read to Ilion to determine what if anything was worth salvaging. In the course of his survey, Mr. Read fortunately became a convert. On his return to Wilmington he made such a strong appeal on Ilion's behalf that he is now credited with almost single-handedly saving the factory.

Despite new DuPont investment which followed, things didn't really turn around at Ilion for some time. New machinery and processes were set up, but DuPont encountered a lot of resistance to attempts to modernize the design of the guns themselves. The problem was mostly how the guns were made, not how well they shot.

Remington's product line had evolved without much continuity over the years, a situation which can play havoc in volume arms manufacture.

Each gun was an individual, and while most worked well enough, their manufacture was slow and inefficient.

An example was the Model 720, the immediate predecessor to the 721 and 722 rifles. It listed at \$97.40 just before the war, certainly no bargain basement price. Though put together from a lot of leftover military parts, it was costing more than that to make and sell. The extremely fine Model 37 target rifle was known around the plant as the Model 37 because that was roughly what Remington was losing on each one.

Under such circumstances, morale throughout the organization was understandably very low, and even with DuPont's help, Ilion's future continued to look dim. The Second War reversed things almost completely. This was not because of the enormous arms contracts, because profits on these were relatively meager. In fact, overbuilding and overexpansion could

easily leave a company like Remington in worse shape than it started. The First War certainly hadn't yielded any lasting economic benefits.

World War II created an opportunity, or excuse, if you will, to "clean house" and modernize at Remington that didn't exist during normal times. DuPont instituted a far-reaching program in anticipation of post-war conditions. Officially titled *Reconversion and Modernization*, it was known around the plant as simply R & M. The 721 and 722 rifles were slated as the vanguard project of this R & M program, and were expected to pave the way for what was to eventually be a whole series of successful new Remington firearms. They were thus extremely critical to Remington's future in the DuPont corporate structure. In turn, success or failure of the new bolt rifles became in large measure the responsibility of one man, Merle (Mike) Walker.

Walker is a native of Iowa, and got an engineering degree from Iowa State in 1934. This was the depth of the Depression, and so almost any job was a welcome blessing. Thus, Walker was more than happy to be working for Dow Chemical in the late 1930s, although he had little desire to finish out his career there.

One might wonder how a person makes the transition from organic chemist to one of the world's top firearm designers working for Remington. Surprisingly enough, Walker simply answered an ad in *The American Rifleman* magazine. He went to Ilion for an interview in April, 1942, and came on board as part of Remington's Research Department three months later. There were a lot of new faces then, as DuPont was assembling a large engineering staff to meet their massive wartime arms commitments.

The new centerfire rifle project officially began on August 12, 1942, with an authorization of \$200 to prepare a project outline, the first "paperwork," so to speak. Later that year, the head of the Research Department, a Dr. R. Hentchel, used another \$11,500 for some preliminary background research. That was as far as things got until Walker took over the project two years later.

During 1942 and 1943 Walker was busy on war jobs, ranging from the development of buttoned rifle barrels manufactured (for Springfield rifles, but later, of course, with industry-wide application) to an optical sighting-in device for the Springfield rifle (which bore some resemblance to the collimators now used by

gunsmiths). He even worked up a 4,250 feet-per-second artillery round capable of defeating the Nazi Tiger tank, though some other method was found and used by the military. Regularly producing 15-inch groups at 1,000 yards, performance of this last item was something even today's long-range target shooters don't scoff at.

In August of 1944, with the Springfield rifle contracts completed, Walker was given \$35,000 to begin making drawings and building prototypes of a new rifle. While designers from other projects were to make important contributions, the actual 721-722 "team" consisted of only three other men; Dana McNally, Leon Rix, and Knute Reed. McNally was an engineer; the other two men assisting Walker working strictly on the boards as draftsmen. While you won't hear them mentioned again, these three in fact bore the yeoman's share of work in getting the new design drawn up and into prototype form.

The paper studies done in 1942 pretty well established what was desired: a light fast-handling rifle which could be made at low enough cost to market successfully and make some money for Remington. Volume would be the key to success. Thus, the new rifles were not primarily targeted to compete with Winchester's Model 70, the leading bolt action of the day, but rather with the Winchester Model 94, Marlin Model 36, and Savage Model 40, which together represented the biggest market for centerfire rifles. Remington gambled that if they could

offer a stronger and more powerful rifle, which still handled as well and sold as cheaply, it would cut deeply into that market.

What makes the 721-722 story worth recounting now in some detail is not simply the fact that the rifles became a commercial success and met the specifications, but that they exceeded them to such an extent that the rifle design remains a leader today, more than 30 years later, and seems to grow stronger each year in the marketplace. It thus, I believe, deserves special recognition alongside other enduring firearms such as the Model 1898 rifle of Paul Mauser, the Colt single-action revolver, and John M. Browning's lever-actions.

Walker's crew had the first drawings of the rifle ready by the end of 1944. They pretty accurately depicted what was to become the production 721, except at the breech. Walker's "counterbore" pattern was one of the last elements of the design to fall into place, and the rifle was originally drawn up with a 35-degree cone breech. Considering that Remington had used a cone pattern since at least 1920, and Winchester still used one, and would in fact for another twenty years, that's not surprising. The 722, when it was later drawn up, differed from the 721 only in length, measuring exactly 0.85 inches less through the magazine and loading port.

#### Design

It might be useful at this point to examine some of the principal mechanical features of the 721-722.



Mike Walker in 1951 with 722 rifle chambered in the then new 222 cartridge.

The most costly single component of a bolt action is its receiver. Thus in cutting costs and production times, Walker had to get away from the traditional forging with its intricate machine work. He was not the first to build a high power rifle from barstock. Savage had done so for many years. His contribution instead lay in utilizing a very simple round receiver which did not finish to look like an overgrown rimfire rifle.

The receiver was carefully proportioned for a trim 1.355-inch diameter, thus making use of standard 1½-inch barstock. Instead of special grooves or slots, the tooling jigs and fixtures indexed directly in the bolt-way. Much effort also went into multiple tooling cuts. Those underneath the tang and bridge, for example, were made on a single pass with three cutters bolted together. A simple bracket blanked from steel plate and clamped between the receiver ring and barrel served as the recoil lug.

The bolt was also "modernized." Besides very large and solid locking lugs, and a bolt handle shaped for low-mounted scopes, its construction was carefully planned for volume manufacture. The "standards" at the time for quality high power bolt action rifles definitely called for a one-piece forged assembly. But such parts were not only very slow and costly to make, the end result wasn't necessarily precise. Walker fabricated his bolt, induction brazing the bolt handle in place with silver solder, and also making the bolt head separate. With the head and body of the bolt machined from barstock, extreme precision and concentricity was possible, while the furnace-brazed joint between them used a copper alloy that for practical purposes yielded one solid piece of steel. As extra insurance, a sturdy steel dowel fits cross ways through the joint.

Besides barstock and screw-machine parts, stampings were used where strength and wear weren't critical. This included the magazine and much of the "fire control unit." To avoid the need for inserts, adjusting screws in this latter assembly threaded directly into the sheet metal by means of 90 degree bends and partial threads cut into opposing interior walls of the trigger housing.

In writing up an incentive award for Walker in 1948, his supervisors noted that whereas the Model 720 bolt and receiver had required a combined total of more than 250 machine operations, the Model 721 required approximately 60. Beyond pure numbers, perhaps a

more accurate gauge of Walker's contribution is the fact that his design allowed the Ilion workforce to produce truly precision parts in volume, and without the high degree of individual skill and workmanship that previously would have been needed.

Cartridges in the new rifle were extracted after firing by a small circular spring inside the bolt head. If any single part played a key role in the 721/722, it was this extractor. Not until it was certain that it worked in a high power rifle, and equally important that it could be successfully mass-produced, could Remington proceed with the final pattern of the bolt and barrel, and the all-important breech formed between them.

When developed by John Howell in 1945 for an unsuccessful autoloading rifle, the extractor's object was not so much a safer and stronger breech, but

rather a cheaper part capable of a surer grip than conventional extractors. It was a crescent-shaped spring with a claw formed in its middle. Instead of being pivoted or collared to the bolt, it snapped into a peripheral groove milled inside the bolt face. Being thus trapped and contained within the counterbore itself, rather than fastened externally, it was less disposed to slippage, and enormous extracting power was potentially possible. Remington later ran advertising claims of double normal strength, based on tear-away tests in which the new extractor held up to around 300 pounds, compared to 150 pounds with conventional types.

But forming the necessary claw on this springy little part very nearly proved its undoing. The machined prototype versions were far too expensive for mass production. The problem was well known throughout the Research Department, and it wasn't until one of the toolmakers, Homer Young, devised a method for coining the claw that this novel extractor could be safely counted as part of the new rifle.

The ejector also occupied the bolt face rather than penetrating from outside. But here the way was shown by our World War II combat rifles, and Walker simply adopted the spring-loaded pins used in the M-1 rifles and carbines.

With everything nestled within the bolt face, it was now possible to ring the cartridge with a solid and unbroken belt of steel. The breech devised and patented by Mike Walker went further than this by also closely counterboring the end of the barrel to accept the bolt nose. Thus the cartridge was not only enshrouded by the bolt, but both were then enshrouded by a barrel flange. If a cartridge tried to rupture, pressure could expand the belt on the front of the bolt only far enough to fill the recess in the barrel.

Attached to the opposite end of the receiver is the fire control unit, more commonly known as the trigger and safety. For the Models 30 and 720, Remington had merely dressed up the existing military triggers. When Winchester introduced a superb new trigger in the Model 70, Remington had little choice but to follow suit. They had fortunately by then acquired a first rate trigger design of their own from a California inventor named John Sweany, and had experience with using it in the Model 37 rimfire target rifles since shortly before World War II.

Walker took the somewhat bulky Sweany layout and reshaped it into a



#### ABOUT THE AUTHOR

*Stuart Otteson once nearly withdrew from human society when, through no personal fault, he lost access to 1500 acres of Virginia groundhog pasture that had been his private preserve. He is a rifle nut. He is also 42, a mechanical engineer, and the writer of The Bolt Action, just about the best book done on rifle actions. If Otteson still could shoot that 1500 acres, we probably wouldn't have the work he does for Rifle magazine, or this piece.*

K.W.

slimmer easy to manufacture unit. It is fully adjustable and has a special spring loaded "connector" piece between the trigger and sear to allow a cleaner pull and the virtual absence of overtravel or "slap."

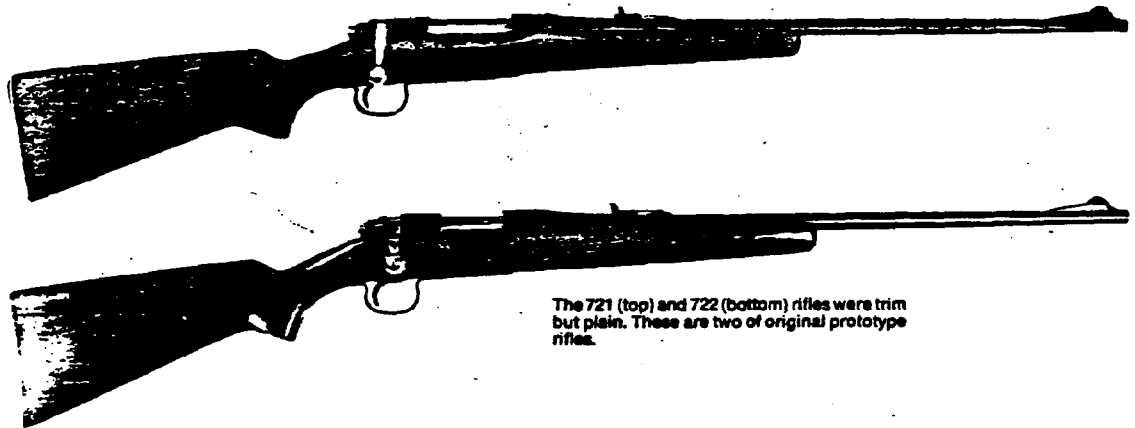
Hinged to the trigger housing is a two position side-mounted safety. It uses a cam to block the sear, a fact that caused the Research Department some unanticipated grief shortly before the rifles were to be released.

The patent attorneys in Bridgeport discovered during a final check of the rifle that this arrangement might in-

The rifle's bolt stop also underwent last minute revision. It originally consisted of a stop lever only, so that like the units fitted many years later to Remington's economy-line Model 600 rifles, something like a small screw-driver or jackknife was needed to get the bolt out. This was generally recognized to be a pretty cheesy arrangement by most Remington employees who handled the early pilot rifles. One of them, Charles Morse, volunteered to devise a linkage release system fitted to the trigger housing (ironically enough, it was

#### Barrels and Sights

The 721 and 722 rifles were fitted with six-groove barrels, rifled by the button system developed by Walker during the war. The standard outside contour was a double taper of medium weight, closely resembling the barrels in the Winchester Model 70. A short distance forward of the receiver ring a swell was formed to serve as the base for the rear sight assembly. Behind this swell, the barrel tapered 0.110 inches per inch, while forward to the muzzle the taper was only one-tenth as steep, 0.011 inches per inch.



The 721 (top) and 722 (bottom) rifles were trim but plain. These are two of original prototype rifles.

fringe the safety in Winchester's Model 52 target rifle, and thus a redesign was ordered. Phil Haskell, a young engineer from the Aberdeen Proving Grounds, got the last-minute assignment. Like Walker, he had arrived via an ad in *The American Rifleman*, although about four years later. After several weeks of pondering the subtleties of such an infringement problem, Haskell split the sear into two side-by-side stampings, one for the trigger and the other for the safety cam.

No one today can fully explain why this change satisfied the attorneys, or even if they originally had that much of a problem. The only sure thing is that a lot of gunsmiths through the years have puzzled over what Remington was up to. In any event, once this "solution" was accepted, the thousands of guns already in the warehouse were uncrated and returned to the factory for refit with two-piece sears.

Morse who would later develop the Model 600). This proved a very auspicious change, as the "new convenient bolt stop" became a major marketing feature of the new rifles.

While, according to Walker, there were literally "thousands" of problems and delays getting the rifles finished up and into production, the only other one he clearly recalls now involved heat treatment. Both to speed production and reduce warpage, the receivers in the first pilot rifles were hardened at the front only. But a color line appeared in the bluing, forcing Remington to start heat treating the entire part. Too much warpage then occurred, however, to allow using close fitting precision bolts. The problem was only solved by going to chrome moly steel and an *austempering* process where a hot salt quench subjects the final machined receiver blank to much less temperature shock and thus less warpage than conventional oil or water quenches.

Although the original 721-722 drawings show four barrel lengths, ranging from 20 to 26 inches, the rifles were introduced in 24 and 26-inch lengths only. The 26-inch length was reserved for 300 H&H (at least until the 222 Remington version was added a couple years later). The magnum barrel was also heavier than the standard contour, the combination increasing the rifle's over-all weight by about one pound. In later years, 22-inch barrels were offered in some calibers.

The receiver was drilled and tapped for scope bases and receiver sights. Some of the very first production rifles lacked holes on top of the bridge for a rear scope base, but this was very quickly corrected after complaints from the gun writers who tried to use them.

Each rifle had a white metal bead front sight dovetailed into a matted ramp brazed to the front of the barrel, and a step adjustable V-notch rear

sight dovetailed into the integral swell near the rear of the barrel. Unlike the Winchester Model 70, this swell did not also serve as the base for a barrel screw, for the 721-722 rifles had semi-floating barrels screwed only to the receiver.

### Weight and Handling

While action strength perhaps made the 721-722 rifles famous, their light weight and good handling also drew praise. The 721 and 722 weighed 7½ and 7 pounds, respectively, very favorable figures for a high power rifle at that time. In comparison, Winchester's Model 70 listed at 7½ pounds, at least until 1952 when their 6½ pound "Featherweight" version came along. And the custom rifles being put together at that time on surplus military actions often tipped the scales at 8 pounds or more.

The stock, although very plain and lacking either checkering or sling swivels, generally met with favor also. Cut from American walnut, it had a good pistol grip and a full semi-beavertail forearm. A shotgun type metal buttplate fitted to the back was nicely checkered to prevent slippage. While normally coming in an iron sight version (dropping 1½ inches at the comb and 2½ inches at the heel), a high comb stock (drop at comb of 1½ inches, and at heel 2¾ inches) more suitable for scope use accompanied the 222 rifle and was optional at no extra cost in other calibers.

### Cartridges

After culling out a few "oddballs" suggested by marketing, such as the 30 Remington, Walker ended up with a lineup of six cartridges for the new rifles. The 721 was slated for 30-06, 270 Winchester, and the 300 H&H Magnum, while in the 722, 220 Swift, 257 Roberts, and 300 Savage chamberings were planned.

During some test firings in 1946, a defective Swift cartridge let go in a 721 rifle Walker was using. While no real damage or injury resulted, the experience nonetheless left a strong impression. Since Walker hadn't been all that anxious about tooling for a special slanted magazine for the Swift anyway, it took only a couple days to decide to kick it from the lineup, leaving only five chamberings at the time the rifles were introduced.

In 1950 a brand new varmint cartridge was developed. Labeled the 222 Remington, it is sometimes assumed to have been developed part and parcel

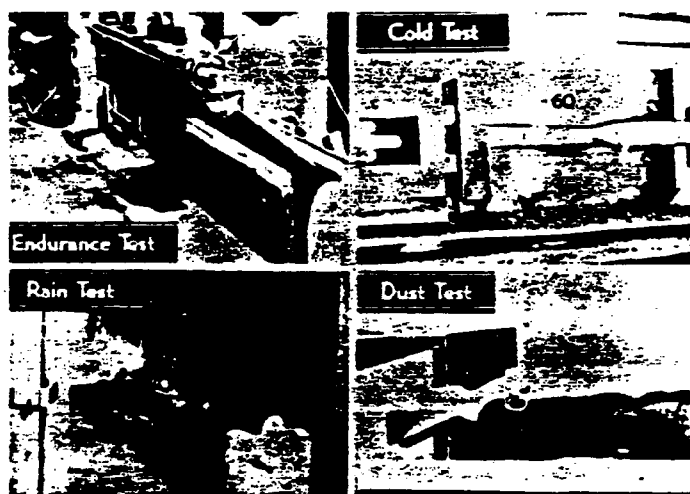
with the new 722 rifle. According to Walker, however, that wasn't the case and there was no tie-in with his earlier decision to drop the 220 Swift.

The 222 modified earlier experimental cartridges developed at Bridgeport to utilize .30 Carbine cup blanks. The original cartridges, while suitable for single shot rifles, were too short to feed in the 722. Walker put a steeper shoulder on the cartridge, lengthened the neck, and then stretched the whole thing out by about ⅜ of an inch so it could better bridge the gap between the magazine and chamber. In the process, velocity was boosted from 2800 to 3200 feet per sec-

Cartridges were, of course, added, and dropped, from the rifles' chamberings in subsequent years. For the 721, the 280 Remington and 264 Winchester Magnum became available, while the 308 Winchester, 244 Remington, 222 Remington Magnum, and 243 Winchester appeared in the lineup for the shorter rifle.

### Tests

The 721 was probably subjected to a more grueling series of tests than any commercial firearm before or since. Wayne Leek, another Aberdeen recruit, ran Ilion's newly formed Test



Excerpt from Remington literature shows stress markers laid on factory tests of the new rifles.

ond with a 50-grain bullet.

Even lengthened, feed with the 222 was less than ideal. But instead of giving up, or going to a different type of magazine and feed system altogether, as Winchester had done for the 22 Hornet, Remington (more specifically, Phil Haskell) kept tinkering with the angles and dimensions of the 722 magazine until it finally digested this little cartridge with some reliability. Also of concern was whether the bullets were too solid for small varmints. After spending a good part of his summer shooting woodchucks with the new cartridge, Walker convinced Bridgeport to swage the bullets from thinner jackets. Thereafter, the cartridge quickly gained popularity, still universal today, and greatly complemented sales of the 722 rifles.

Department. He introduced a lot of military methods, applying them with a vengeance to his first victim, the new 721 rifle.

These included a dust test, ice test, rain test, and blow-up test. An automatic fixture was built which put the rifles through 50,000 cycles to check wear of the bolt and firing system. Leek also placed the 721 prototypes in an "iron lung" for gas-leak tests using white blotter paper and cartridges filled down to the point that their heads would open up and spill gas upon firing. The rifle came through this latter test pretty well, except that the cocking piece was somewhat disposed to blow back through the unshrouded bolt sleeve. While it never got completely away, it did exhibit a nasty habit of cocking on the receiver.



When loaded with dust, a perhaps unrealistic criterion for a non-military arm, the cocking piece also tended to bind with the sear. To overcome this, the flat area of contact between these two pieces was relieved by cutting serrations into the top of the sear. For production, the same result was gained with less expense by simply lathe-turning the cocking piece to yield a radius contact surface with the sear below.

The blow-up tests were the big thing, and the most publicized. They were run on two 721 rifles chambered for 30-06, which Walker considered the worst cartridge from a blow-up

scrap at much lower pressures.

#### Patents

Besides the button rifling patent (no. 2,383,356 issued August 21, 1945), three others related specifically to the 721-722 rifles. Number 2,473,373, covering John Howell's extractor, was filed on January 30, 1946 and issued a little over three years later on June 14, 1949. The next (no. 2,514,981), for Walker's redesign of the Sweeney trigger, plus Haskell's work on the safety, was filed on February 12, 1948 and issued July 11, 1950.

The last, number 2,585,195 cover-

Thus there was great difficulty with the application. Remington's attorneys and the Patent Office went around and around on the invention, the Patent Office seemingly determined to throw just about every patent they could lay their hands on against it, particularly the just-issued Howell patent.

Remington not only had to come up with depositions establishing when, where, and who did what on the new rifle, they pulled out all stops to convince the people in Washington of its overwhelming technical merits. Copies of the many favorable gun reviews were furnished. Twice the Remington attorneys lugged down all the rifle specimens used in the blow-up tests, the wrecked Mausers, Springfield, Winchester, etc., as well as the unscathed 721s. They once even took the head examiner over to the Arlington Rifle Club for an afternoon's shooting with the new rifles.

By going back and blowing up a 721 rifle with the barrel flange machined away, Remington finally convinced the Patent Office that it was not Howell's bolt face alone that accounted for the new breech's remarkable strength, but that in fact the barrel flange was the real key which allowed continued support of the cartridge under the most extreme pressure conditions. The Patent Office thereupon relented, and issued Walker's patent on February 12, 1952.

#### Introduction and Delivery

While development of the 721-722 was a well kept secret at the factory, a select group of gun writers examined pilot rifles in the spring of 1947, and soon rumors of a new Remington rifle were surfacing. Those actually shown rifles probably didn't do too much talking, however, at least in specifics, because rumors centered on a commercialized version of the Springfield.

Considering the million-plus



Mike Walker around 1952 testing one of first 222 benchrest rifles. Mike and his wife Olive were among leading stool shooters in the '50s and '60s.

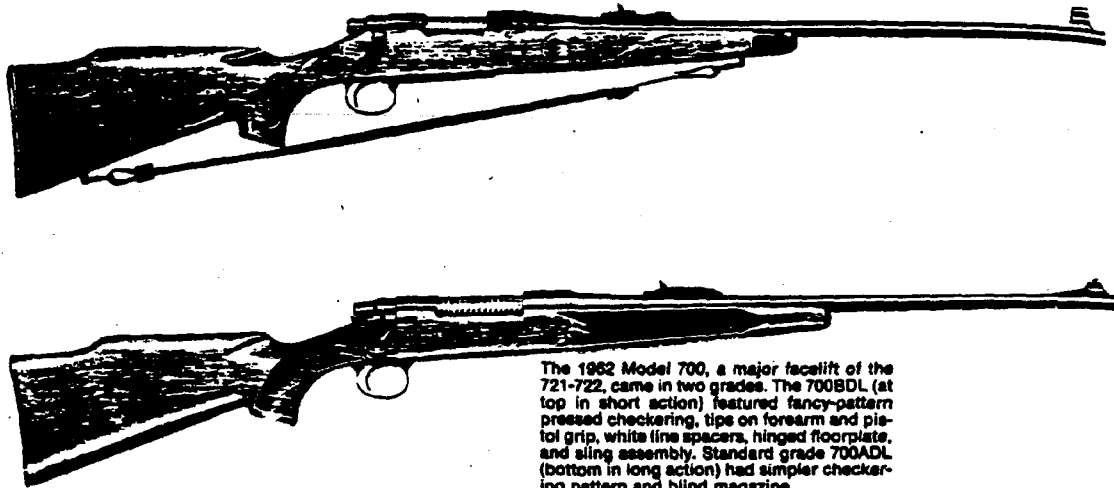
standpoint. Starting with a proof cartridge, 220-grain bullets were progressively lodged in front for each shot until the rifles no longer functioned. By the fifth extra bullet, the bolt head had expanded into the barrel counter-bore so tightly in both rifles that the bolt handles were broken off trying to open them. But because the enshrouded cartridge heads remained intact through it all, no further damage occurred and the only gas to escape came through the primer.

Such conditions far exceeded anything that a brass cartridge head could withstand alone. According to Remington, the two 721 pilot rifles were subject to pressures estimated as high as 309,000 pounds per square inch. Conventional rifles tested alongside them for comparison all turned to

ing Mike Walker's counterbore breeching mechanism, wasn't filed until January 8, 1949, almost a full year after official announcement of the new rifles, and at a time when many thousands were already in circulation.

#### Remington 721/722 Specifications

Caliber	Rifle	Magazine capacity	Over-all length	Weight	Barrel length
30-06	721	4	44 1/4	7 1/4	24
270	721	4	44 1/4	7 1/4	24
308 H & H	721	3	45 1/4	8 1/4	26
308 Savage	722	4	43 1/4	7	24
257 Roberts	722	4	43 1/4	7	24
222 Remington	722	5	45 1/4	7 1/2	26



The 1962 Model 700, a major facelift of the 721-722, came in two grades. The 700BDL (at top in short action) featured fancy-pattern pressed checkering, tips on forearm and pistol grip, white line spacers, hinged floorplate, and sling assembly. Standard grade 700ADL (bottom in long action) had simpler checkering pattern and blind magazine.

Springfield rifles Remington had just finished cranking out for the Army, such a conclusion wasn't irrational. In fact, there were those at Remington who had originally leaned strongly in that direction. But once Mike Walker took charge, there was no further hesitation about going to a completely new rifle. He had carefully studied Remington's pre-war experiences, and well knew that even though development costs might be much lower, making converted military rifles was not profitable in the long run.

Marketing had originally scheduled announcement of the new rifles for January, 1947. Since that committed them to a wholly impractical timetable, Walker and the rest of the Research staff got a little stirred up, to put it mildly. Even 1948 presented a lot of problems, but an announcement date of January 21, 1948 was finally agreed on.

The 721 and 722 were cataloged at \$79.95 and \$74.95 respectively, compared to \$59.50 for Winchester's Model 94, \$58.75 for the Marlin Model 36, and \$52.40 for the Savage Model 40. While thus falling a little short of the original pricing goals, they were still comfortably below the \$106.00 that the Model 70 was commanding at the time. To their advantage, the 722 offered U.S. shooters the first true short-actioned production bolt rifle in some 20 years.

It was also very helpful that deliveries of Model 70 rifles following the war were so slow that it was often dif-

ficult to lay hands on one at almost any price. Many shooters were turning in desperation to custom rifles built on surplus military actions, running \$175 and up for decent specimens. The market was ripe for an eighty-dollar rifle with state-of-the-art performance.

The first small lot of production guns was distributed to writers for evaluation in the fall of 1947. Deliveries to wholesalers were scheduled to begin by caliber as follows:

30-06 Springfield ..	March 1948
300 Savage .....	May 1948
270 Winchester and 257 Roberts .....	July 1948
300 H&H Magnum .....	September 1948

The rifles were officially designated the 721A and 722A to denote a "standard" grade. "Fancy" grades were also offered, the B (Special) with a checkered stock of selected walnut and sling swivels, and D (Peerless) and F (Premier) grades which featured even better wood, plus engraving. There were also later designations such as the 721AC-722AC and 721BDL-722BDL, but in practice even Remington marketing seldom used suffixes, and the guns were invariably referred to simply as Models 721 and 722.

#### Sales

Sales of the Model 30 and 720 rifles which preceded the 721-722 had totaled a scant 25,000, roughly 1,000 rifles a year. Thus DuPont knew that the new rifle had nowhere to go but up.

The big question, of course, was how far? Development of the rifles cost \$175,000, and tooling roughly another million. New high-volume guns coming out today routinely cost a lot more, but that was an unprecedented investment for the time, and an enormous pile of pre-1950 dollars.

DuPont gambled that the low retail price made possible by the new machinery and processes would generate enough sales volume in the post-war market to recover the investment. The break-even point was figured to be approximately 15,000 rifles per year. Considering Remington's dismal pre-war sales record, the whole thing obviously required some confidence on management's part.

An opportune juxtaposition of a good rifle, low retail price, and booming post-war demand for high power hunting rifles brought an acceptance and sales volume that took even Remington by surprise. Favorable articles and evaluations began pouring in so fast that the Marketing Department compiled a 23-page booklet entitled "What The Experts Say About the New Remington Models 721 & 722 Big Game Rifles." It contained twenty writeups which appeared in print during the first four months of 1948, ranging all the way from a brief announcement in the *New York Times*, to an exhaustive dual evaluation in *The American Rifleman* by the esteemed team of Julian Hatcher and Al Barr.

The following summary of the "ex-

perts" reactions shows they liked a lot more things about Remington's new rifles than they disliked:

#### Features acclaimed:

1. Light weight and good balance.
2. Strength.
3. Safety.
4. Speed and smoothness of operation.
5. Good stock lines and proportions.
6. Convenient and noiseless safety.
7. Convenient bolt stop.
8. Extractor strength.
9. Low selling price.
10. "Miracle" trigger.
11. Bolt handle shape and safety location for low-mounted scopes.
12. Smooth and clean receiver lines.

Most of the complaints about "austerity" were tempered by a recognition that the very favorable retail price of the new rifles forced Remington to keep some things basic. The lack of checkering on the stock was a good example. Even at the labor rates then, hand checkering would have boosted the rifles' retail price by between \$10 and \$15, bringing it up closer than Remington wanted to be to the Model 70.

The first full year's production (1949) was approximately 42,000 rifles, and that was more a manufacturing limitation than anything else, because for the first couple years the factory was working day and night and Remington was selling everything they could ship from Ilion. Sales in 1950 topped 60,000.

But the rifle's engineering virtues could sustain this level of sales only so long. Very plain and unexciting lines limited its ultimate sales potential.

at Remington very happy, but they didn't satisfy Walker, and he had a completely restyled rifle ready for 1952. Remington's management, loth to tamper with success, vetoed the change. The same thing occurred in 1960.

Meanwhile, in 1958 another rifle with obviously close ties was briefly added to the Remington product line alongside the 721 and 722. The Model 725 originated on "the other side of the house" insofar as Remington's engineering organization was concerned, being designed under Wayne Leek, who had by then come up from the testing department to become a design supervisor, mostly for shotguns and rimfire rifles.

While the 725 had a slightly swept back bolt handle, releasable floorplate, and checkered stock, it also tended to harken back to Remington's pre-war rifles, in the process requiring some expensive extra machining cuts. Sales were poor, about 10,000 rifles total, and it was discontinued after three years.

The commercial failure of this rifle obviously helped persuade management finally to approve Walker's redesign of the 721-722. In 1962 the Remington Model 700 came into being, superseding the 721 and 722. At the same time sales began to take off, climbing back into the 50,000 to 60,000 category in the first year of production. They have been on the rise ever since, eventually surpassing 100,000 per year and making the Model 700 (which is really still just a prettied up 721/722) easily the best bolt-action seller in the world, today pursued seriously only by Ruger's Model 77.



Two men who actively contributed to 721-722 project: Wayne Leek (left) tested the rifles; Homer Young figured out how to manufacture the little spring clip extractors.

#### Features criticized:

1. Lack of scope base holes on bridge (immediately corrected).
2. Non-detachable sheet metal floorplate and trigger guard.
3. Plain unchecked varnish-finished stock.
4. Lack of sling swivels.

While it certainly wasn't ugly, neither could anyone ever accuse it of winning any beauty contests against the Model 70, or even the many custom-built Mausers, Springfields, and Enfields, for that matter. In 1951 sales began to cool off, thereafter settling down into the 30,000 range, although there were one or two more 50,000-rifle years.

Such sales continued to make many

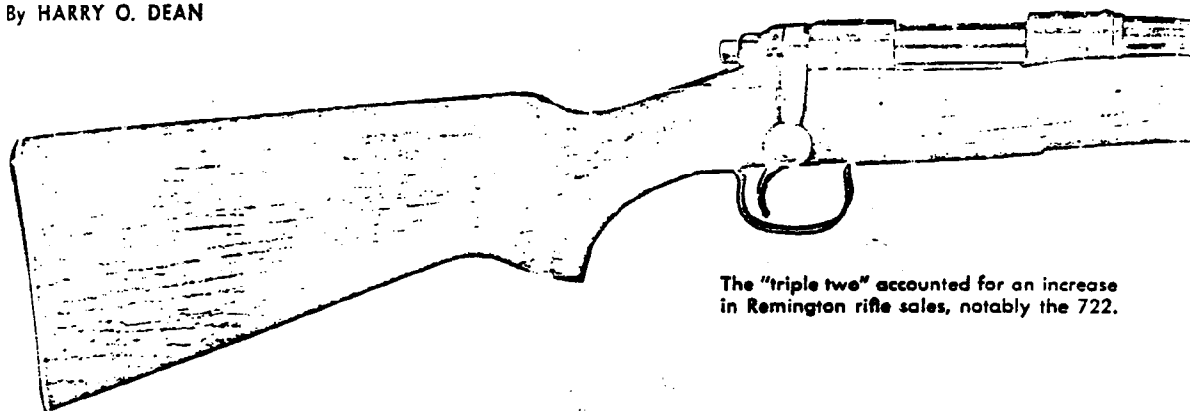
#### ACKNOWLEDGEMENTS

Several current and former Remington employees helped gather material for this article. I want to thank Ted McCawley, Clark Workman, Mike Walker, Larry Goodstal, Phil Haskell and, most particularly, Sam Alvis, former Chief Engineer at Ilion and, in retirement, Ilion's untiring historian and archivist.

Stuart Otteson

# TRIPLE TWO

By HARRY O. DEAN



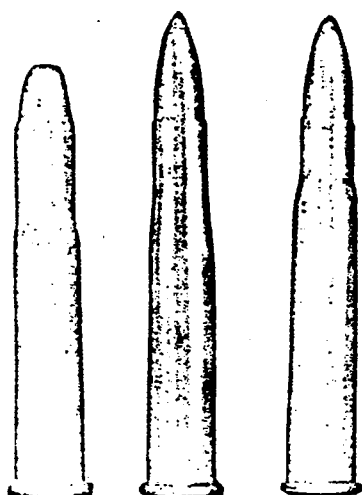
The "triple two" accounted for an increase in Remington rifle sales, notably the 722.

THE REMINGTON Arms Company announced a new small game and varmint cartridge back in 1950, named the .222 Remington. They didn't know it at the time, but they had started rolling a small snowball that got bigger and bigger until it just about crushed every other cartridge that had ever been popular for small game. The new .222 Remington cartridge was fully deserving of every accolade it received. It was small, neat, attractive, had a mild report, was economical to reload, and above all, it was so fantastically

accurate that it put all other cartridges in the shade. Yes, for such a small cartridge, the .222 Remington certainly casts a long shadow.

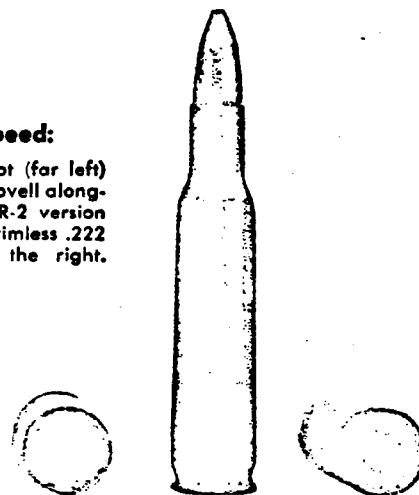
Prior to the advent of the "triple two" Remington, the varmint field was occupied by a random scattering of cartridges, many of them wildcats. The .22 Hornet was still holding its own as the most popular of the "settled area" calibers. There were a number of shooters who felt that a heavier bullet, of around 50 grains, would have better ranging qualities and be less sensi-

tive to wind. The .218 Bee had been announced, using the Hornet bullet at a stepped up velocity. The buzz of the Bee never got very loud; it never really out-hummed the Hornet. Another brief flirtation was the .219 Zipper. Larger and more powerful, the Zipper came unzipped for lack of a suitably accurate rifle. The .220 Swift was highly touted and it was a real long range blaster but therein lay the trouble. Good as it was, the tiny .22 bore of the swift had a loud and raucous bark that shattered the hillside. This caused

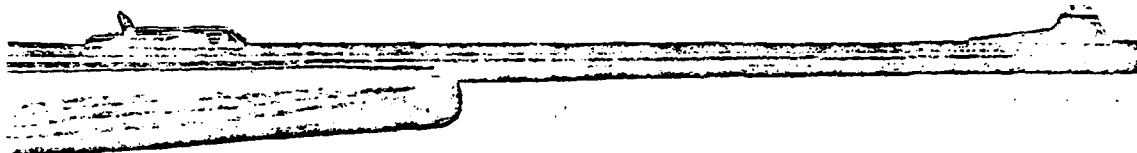


## Evolution of Speed:

The old .22-20 single shot (far left) preceeded the .22-3000 Lovell alongside it. The shouldered R-2 version is next in line, while the rimless .222 Remington appears at the right.



# TERROR...



many a fretful farmer to hotfoot out and holler, "What in tarnation is goin on!" The Swift was for open country!

Turning the pages back to 1933, we find a gunsmith named Hervey Lovell amusing himself with a snappy little varmint cartridge of his own making. He used the old straight-walled .25-20 single shot cartridge and necked it to .22 caliber with a long tapered shoulder. He found that he could achieve about 3000 feet per second using the .22 Hornet bullet. He called it the ".22-3000", and after describing it in the "American Rifleman" magazine, he was deluged with requests to make up rifles. Case dimensions were finally standardized and published and thereafter other gunsmiths were kept busy making up special rifles for the cartridge which now bore the name ".22-3000 Lovell."

What Mr. Lovell didn't know was that Charles Newton had done the very same thing around the turn of the century but was hampered by poor powders.

Gun experimenter and target buff Harvey Donaldson of Fultonville, N.Y. found the .22-3000 an interesting and accurate cartridge but could not resist the opportunity to develop it further. He consorted with gunsmith M. S. Risley of Earlville, N.Y. and they set about to modernize the case and improve the ballistics. The version which showed the most promise was called the R-2 Lovell and it allowed the use of heavier bullets for improved ranging qualities. The Risley version proved so accurate and so flexible in its loading characteristics that the majority of .22-3000 Lovell owners had their chambers recut to the R-2 version. My own R-2 Lovell was a Stevens 44½ action with heavy barrel relined and chambered by Parker O. Ackley. With 8-X scope, it accounted for its share of Western New York woodchucks. (Continued on page 62)

GUNS • APRIL 1969



## .222 Remington Technical Data

The .222 Remington uses a 50 grain soft point spitzer bullet. A metal cased bullet of identical ballistics is available for special applications where a non-expanding bullet is desired. (i.e. Turkey) The following are the ballistics of factory loads:

Muzzle	Velocity—Feet per Second		
	100 Yards	200 Yards	300 Yards
3200	2650	2170	1750
1140	Energy—Foot Pounds		
	780	520	340

Many .222 owners sight their rifles to zero at 200 yards with the bullet striking 2" high at 100 yards. To narrow the vertical dispersion (especially the rise) from the muzzle to the practical range limit of 250 yards, the author favors a zero at 175 yards with scope sighted rifles. The approximate impact points at various ranges will then round out as follows: ½ inch high at 50 yards, 1½ inch high at 100, 1 inch high at 150, 1 inch low at 200 and 4¼ inches low at 250 yards. Individual rifles will show slight variations due to scope height.

Roughly, this indicates that your .222 will strike within a 6 inch vertical from bore to target. For example: on a sitting woodchuck, you should hold on the chest up to 200 yards. Beyond 200 yards, you hold on the head and the bullets will strike the chest area. Try it!

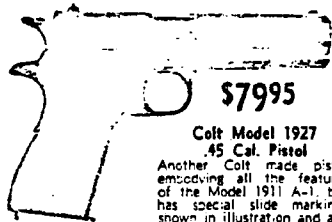
Handloaders may better the factory load by using the 50 grain bullet and 24 grains Dupont #3031. For higher retained velocity (like the .222 Magnum) try the same Dupont recommended load of 24 grains of #3031 but with the 55 grain spitzer bullet at 3155 feet per second. A slower start to a faster finish!

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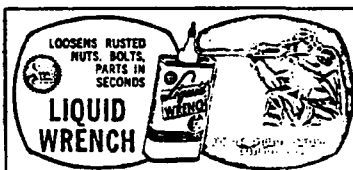
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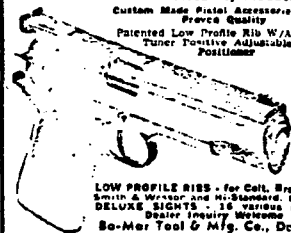
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on the right side of the frame, toward  
the left. As soon as it clears the slide  
cut, the slide latch may be withdrawn  
from the frame. Slide and its com-  
ponents may now be run forward off  
the frame. To remove recoil spring as-  
sembly from slide, pull barrel base  
away from barrel until it clears the  
lower lug, and remove the assembly  
to the rear. Barrel may now be lifted  
from the lower slide opening. Reas-  
semble in reverse order. When re-  
moving and replacing slide latch, be  
sure it is properly aligned with its  
corresponding openings and not al-  
lowed to turn, or it will mar the finish  
of slide or frame. For the non-gun-  
smith, any further disassembly is defi-  
nitely not recommended.

Markings of interest to collectors  
are apparently the same on the com-  
mercial and military models, with the  
exception already mentioned, the  
grips. On the left slide flat, "PIS-  
TOLET AUTOMATIQUE MAB BRE-  
VETE-S.G.D.G." The "MAB" at the  
center is in the larger stylized letters  
of the trademark. On the right upper  
slide flat, forward of the ejection port,  
"MODELE PA-15." Just below this,  
"MADE IN FRANCE." On the right  
frame above the trigger, "PA. 15 M1"  
—followed by the serial number. On  
the barrel at the ejection port, "CAL.  
9 mm." Proof testing marks appear on

the barrel, right rear slide flat, and  
right forward trigger guard base.

In making a choice between the  
MAB PA-15 and the Browning P-35,  
these points must be considered: The  
MAB gives you one more round in  
fully loaded capacity than the Brown-  
ing with Canadian magazine, and its  
weight aids in accuracy. On the other  
hand, the Browning is 7.15 ounces  
lighter, and slightly more compact.  
Assuming that you will practice quite  
a bit with whatever you buy, the in-  
herent accuracy factor becomes less  
important. After using my P-35  
Browning for 16 years, I can do a  
bit better with it than with the new  
MAB. So, it comes down to this: Is  
the extra round worth the difference  
in weight? In some situations, it could  
make a lot of difference. With two  
spare magazines, it would mean three  
extra rounds. As always, this is a  
question the buyer must decide for  
himself.

The PA-15 is well-designed, well-  
made, reliable, and of very sturdy  
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the extra weight, and if you want the  
ultimate in handgun magazine capac-  
ity, this is the one to buy. The MAB  
PA-15 is imported by Centennial  
Arms, 3318 W. Devon Ave., Lincoln-  
wood, Ill. Your local dealer  
can order one for you.

## TRIPLE TWO TERROR

(Continued from page 31)

Prior to World War Two, our small  
game and varmint hunters were rais-  
ing a demand for a factory made  
cartridge on the order of the R-2  
Lovell. A number of proposals were  
made, including a suggestion to pro-  
duce a rimless version. I recall a  
sketch of a proposed "Rimless Lovell"  
that appeared in the "Dope Bag" sec-  
tion of the "American Rifleman."

Sport shooting tapered off during  
the war to ammunition shortages and  
the cry for a factory Lovell turned to  
echos. The dull rumblings rose again  
after the conflict and a lush market  
awaited the program move.

Around 1950, Remington unclocked  
its new wonder cartridge, the .222  
Remington! To steer this sassy speed-  
ster, they offered a sleek, short-action  
boltgun, the Model 722. One of these  
promptly found its way into my gun  
rack.

The new cartridge design was cred-  
ited to Mike Walker of Remington  
Research and Development Center.  
Maybe they should have called it

"Mikes Marvel". At any rate, Mike  
Walker is an avid accuracy addict  
with an impressive list of successes in  
bench rest competition. The sweet  
shooting .222 soon proved that it could  
spit its spitzers into uncommonly  
small groups and it earned numerous  
wins in precision shooting matches.

The .222 Remington was announced  
as the first completely new commer-  
cial cartridge developed in many  
years. It was not revamped from any  
existing cartridge case. This is true,  
in a sense. However, I strongly sus-  
pect that it evolved from the rimless  
.30 carbine cartridge. By using a sim-  
ilar head and a longer cup draw and  
necking the new length to .22 you  
have the answer. This does not alter  
the "new" claim because the .30 car-  
bine cartridge was, at that time, not  
a commercial cartridge. It is also pos-  
sible that the R-2 wildcat came under  
scrutiny in arriving at a proper case  
capacity. I do not mean that the  
sharpshooting .222 is a rimless copy-  
cat of the old Lovell. Modern design

and development techniques were in evidence to obtain the proper capacity-pressure-velocity ratio that allows that 50 grain bullet to attain its 3200 f.p.s. velocity with moderate pressures. Further proof of its over-all compatibility is evidenced by its excellent handloading characteristics. Any way you look at it, the .222 Remington is a gem!

The boys who like to refill their brass can take particular delight in the rewarding results obtained with the "triple two" terror. It is actually difficult to make the .222 shoot bad—and apparently any clumsy clown can make it shoot good!

I admire the Hornet but I must admit you can make a Hornet out of the .222 at will. You merely look up a docile load that moves a 46 grain bullet at 2690 feet per second and there you have it! Now then, would you like to try a .218 Bee? Just pick a load that adds about 170 f.p.s. to the same bullet and you're in business. How do you like that for flexibility? We could go on and on, mentioning



cast bullet loads that will slap squirrels without a mess, plus turkey taggers, target trophy takers, cheap plinking loads—you name it and the .222 can deliver it! From tin cans on the farmyard fence to a chicken chompin' red fox at 250 yards, the triple two is right in its element.

I just made mention of a 250 yard distance on old Reynard the fox. That's a good limit for the .222. I will grant that occasional hits have been made on small game beyond that range. However, a good rifleman who is also a good sportsman will always recognize the limitations of his rifle. Every gun has its practical effective range. Let's be fair. The .222 is accurate, humane and effective out to 250 yards. Come to think of it, that's pretty darn far! Pace it off and see.

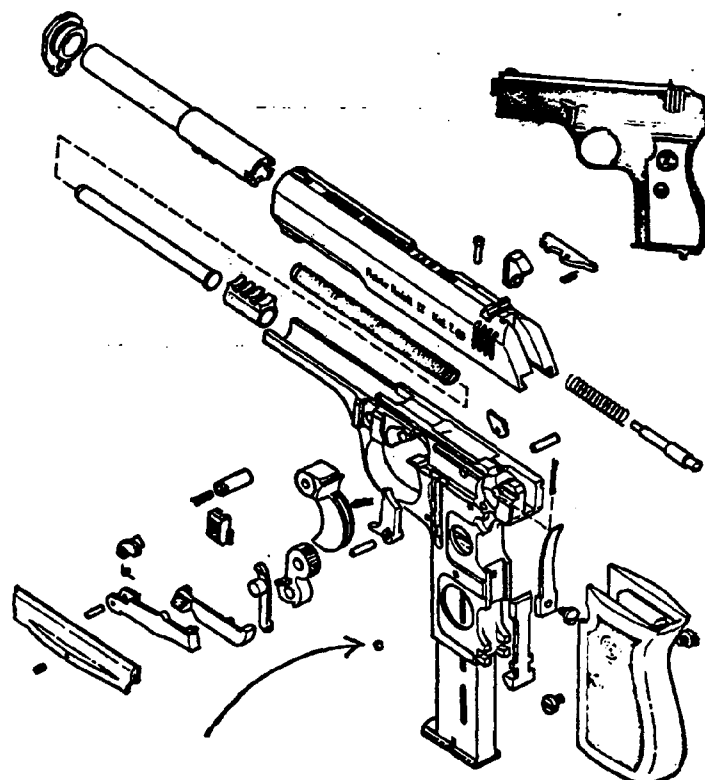
A few years after the .222 was announced, a big brother appeared. By lengthening the "triple two" case, Remington made a cartridge that was submitted to an Ordnance Board studying the military aspects of high velocity .22's. The cartridge was not accepted and it was decided to market the new round commercially. Named the ".222 Magnum," the new cartridge became a bigger, but younger, brother



# AN INSIDE LOOK

AT THE WALTHER MODEL 9

By SHELLEY BRAVERMAN



**A**DOPTED BY THE CZECH Government in 1927, the Model P/27 was the last of a series of pistols developed from a Mauser design circa 1920. The safety and its "push-button" release is strictly Mauser and probably was the excuse for the royalty payments. Note that the release catch follows the Mauser M/1910 design; the wider, M/1934 catch was yet to be introduced. The disconnector-sear design is suggestive of the Orgies pistol; the firing pin retainer is similar to the Colt M/1911 .45 Auto.

As would be expected, the quality of workmanship of mechanism is excellent; the gun is reliable and very accurate.

In addition to the regular issue for Czech Official use, two others are to be encountered. A somewhat rough (externally) variation was produced for German Military use. There was also the commercial issue, well finished and with walnut grips. Parts are interchangeable

able for the three issues.

The magazine follower will come up and hold the slide back when last shot is fired; unlike the Mauser 1910/34, pulling out the empty magazine will allow the slide to close—thus this feature is only an indicator for "empty pistol" and not a convenience for reloading in emergencies.

**To field strip:** Retract slide over empty magazine. (2) Press right end of take-down latch inward while maintaining downward pressure on latch release on left side of gun. (3) Withdraw latch assembly to left and out. (4) Holding slide and frame together, withdraw magazine. (5) Ease slide forward. Assemble in reverse order.

It is reported that production of the P/27 was discontinued a few years ago; as a representative martial it is expected that remaining specimens will be subject to sharp price increases.

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to the time tested .222.

The new round offered a bullet that was five grains heavier and 100 fps faster. This gave it slightly better ranging qualities plus improved wind resistance. However, the ballistic advantage is quite nominal in this writer's opinion and is certainly not enough to substantially shadow the vast popularity of the standard .222 in the eyes of varminters.

Shortly thereafter, our Ordnance

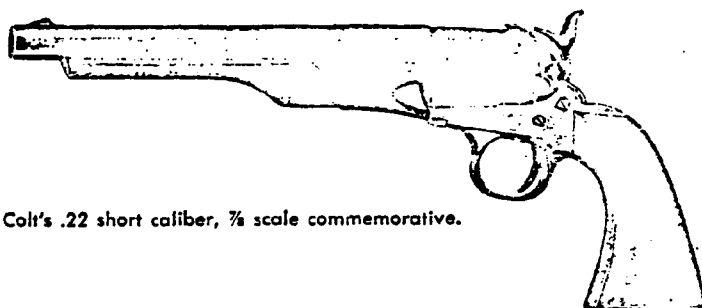
did adopt a 5.56 mm military round which appeared commercially as the .223 Remington. Here again we meet big brother competition in a case that is slightly smaller than the .222 Magnum. Its 55 grain bullet moves just under 3200 fps. Again, no great sweat for the triple two. The .223 may get a surge in the future if surplus stocks of military ammo are turned loose, but to date, the .222 Remington is still king of the castle!

## COMMEMORATIVE GUNS

(Continued from page 26)

and at the same time reduced and curbed their value. The same thing happened in a more marked way to the Remington double-deringer .41 Caliber rim fire. It was on its way to becoming a valuable gun when all sorts of imitations appeared on the market in calibers from .22 rim fire to .357 magnum. Therefore, I don't think reproductions of any type have in the long run really bolstered the value of a collection of genuine guns. We still have the economic law of supply and demand and as supply is increased there will be a correspond- ing drop in demand.

been for this, many of us might have gone in ignorance to our graves without knowing that there even was a Genesco, Illinois, let alone that it had survived 125 years. But with this issue of a new/old gun, Colt opened the flood gates. We now find in our ranks a new collector, called in Christian charity, the Commemorative gun collector. This new breed had another thing going for him. If he had enough money he could own a complete set of all the Commemorative guns ever made, overnight, collections sprung up. I know of a man who never owned a gun until the mid 1960's who started



Colt's .22 short caliber, 7/8 scale commemorative.

I have watched with interest a new dimension in gun collecting which started about 1961. It is called collect- ing commemorative guns, but even this description fails to explain the whole phenomenon. Colt, which had always been a rather conservative New England-type firm, started mak- ing a type of reproduced firearm called a "Commemorative".

To give you an idea of how far the word "Commemorative" can be stretched—let us look at the first set of Deringers that were made by Colt and contracts for by an Illinois dealer. They were to commemorate the 125th anniversary of this dealer's home town—Genesco, Illinois. Had it not

winning prizes for the most complete display of Commemorative Colts.

We of the old guard thought this madness would pass, but so far it has not. We pointed out that the fun of collecting used to be the thrill of the chase. One would hear a vague rumor that a certain farmer, always miles away, had a certain rare pistol. The old-school collector would approach his quarry, the farmer, as a leopard stalks a nervous deer. Finally, maybe months later, the collector had the pistol, the farmer had all the collec- tor's loose cash, everybody was satis- fied, and the collector returned to his lair a contented and weary man.

Not so with Commemoratives. In



# The Hot XP-100



# And New .221 Fire Ball

SINCE members of our staff first saw the XP-100 back at Bridgeport, Connecticut, in November, we've been bugging Ted McCawley of Remington to get us one for testing purposes.

Problem in the beginning was the fact that there was only one, but through a weekly harassing action, we finally had an XP-100 shipped to us air mail, and McCawley was able to breathe a sigh of relief.

The novel handgun arrived in great shape, then we began matching deadlines against dates, wondering when the boxes of the new .221 Remington Fire Ball ammo would arrive, and whether we would be able to work in a gun test before this issue had to be off to the printer.

When we were about to give up, the ammunition arrived: four full boxes. We immediately gathered the group and headed for the Pasadena Police Range, where Duke Roberts holds sway.

There probably never has been a new, unusual design in firearms presented for public approval — or disapproval — that has not created its share of ulcers, while the manufacturers nervously waited to learn what the buyer's opinion would be.

Remington Arms, which has not produced a handgun in something like half a century, is taking this type of gamble with corporate eyes wide open in introducing the XP-100.

This new and unlikely handgun is described as a bolt action, single shot, center fire pistol, and is designed specifically to handle the equally new .221 Fire Ball.

The company's researchers are correct, of course, when they state that in recent years, an increasing number of shooters have become interested in long

range varmint and small game hunting with handguns. A variety of cartridges with jacketed bullets for high velocities and flat trajectories have been introduced for this type of shooting, not to mention specially designed telescopic sights.

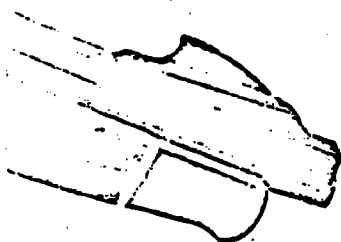
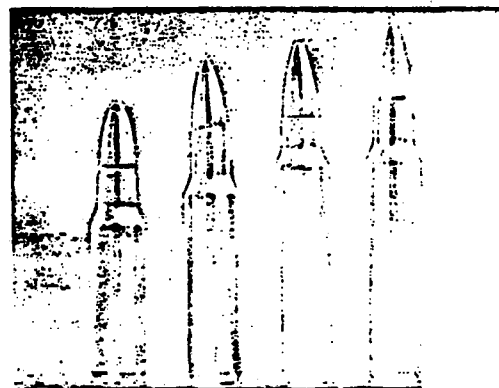
The optics of these scopes and the ballistic potential of the cartridges have been proven, the Remington folks insist, then add that because of inherent characteristics in the designs of conventional handguns, few shooters can hold well enough to take maximum advantage at long ranges.

There are handgunners who will argue that point, naturally, but the new XP-100, which was long a closely guarded secret, is meant to fill this supposed gap.

The grip and stock of this gun are of one-piece molded Zytel, a new structural nylon. The action is patterned frankly after Remington's bolt action center fire rifles, while the stock obviously is derived from the plastic-stocked .22 rimfire rifles in the company's line. But there is where similarity ends: the rest looks like something straight out of the Space Age.

Wayne Lock, who designed the gun — improving his own shooting along the way, he insists — says that the Zytel material maintains dimensional stability under all conditions, and cannot warp or change shape. Result is uniform barrel bedding for accuracy. The

From left: New .221 Remington long range handgun cartridge is compared with .222; Remington .223 designed for military use; .222 magnum. Shown actual size.





Duke Roberts squeezes one off, using Bushnell's Phantom handgun scope, while Jack Lewis checks hits through the new Balscope Zoom 60. Latter will focus from ten yards

to infinity with only a flick of the dial set in the top of the tube. Another thumb dial can regulate the image 10 to 60 power. It's manufactured by Bausch and Lomb.

grip is contoured to fit the shooter's hand and is equally adapted to either right or left-handed use. We also found that it fits well with a two-handed hold.

A ventilated rib is used on the barrel to improve the sighting plane, while a blade front sight — again familiarly found on the Nylon 66 — and a rifle-type rear sight with adjustments for windage and elevation are incorporated. The receiver is drilled and tapped for scope blocks.

Overall length of this Buck Rogers dream is 16 3/4 inches, and weight is 3 3/4 pounds. Barrel length is 10 1/2 inches. The gun has decorative checkering, white spacers and diamond inlays in stock and grip. There's also a cavity in the fore end that permits weights to suit your own tastes in balance.

Sounds weird, doesn't it? When writers saw it in November, there was a good deal of speculation con-

cerning potential success. This led to our doing some research on other guns that were ahead of — or behind — their time; the difference is not always apparent.

For example, as long ago as sixty-three years, Winchester tried a .22 bolt action, single-shot handgun. Admittedly, this, the Model 1900, didn't have any of the refinements of the XP-100. It is thought that the New Haven tribe made only twenty-five of these on an experimental basis, dropping the entire project when it was decided it had little commercial appeal.

The frame of this particular handgun was of brass, which was nickel-plated, while grips were of buried walnut. Today, there are only five known specimens in existence, and three of these are in the Winchester Museum. As collector items, these guns are valued at more than \$400 each.

More recently — about five years ago — Whitney Arms of Hartford, Connecticut, came out with an accurate .22 Autoloader, holding ten rounds of long rifle 22s. Although more than adequate for the price, it never became a huge commercial winner. Experts, if there really are any in gun marketing, blame this upon the acutely modernistic design, claiming that gun buyers were not yet educated toward such streamlining.

But the XP-100 has a built-in advantage; it is not just a gimmick gun. It was developed for a particular purpose: Long range hunting with a centerfire cartridge.

When the group gathered at the Pasadena range, roll call found staffers Ray Rich, Dan Cotterman, Jack Lewis and Duke Roberts on hand to evaluate the new gun. Looking on, and eventually shooting, were Jack Miller, who is range supervisor for the Pasadena Parks Department, and Jack Preston, one of his assistants.

Everyone who had not previously seen the new handgun was immediately intrigued with the novel design. At first, the weight seemed to frighten them, but there is enough aft poundage so that the gun balances well in the hand. . . . Not that it doesn't become almost immediately noticeable when shooting off-hand. That three-plus pounds begins to weigh heavily in a matter of seconds.

To the gun, we had attached Bushnell's Phantom scope with their new mounts designed specifically for the XP-100. For a warmup, we tried a few rounds through the chronograph and found that velocities hit along at an average of 2650 feet per second.

This is precisely the velocities claimed by the manufacturer, which was a pleasant surprise. In the past, nearly all ammo makers have tended to puff up

Jerry Mills holds aloft the bobcat which he shot with his first round out of the new Remington XP-100. The cat was downed at approximately sixty yards shortly after dawn.

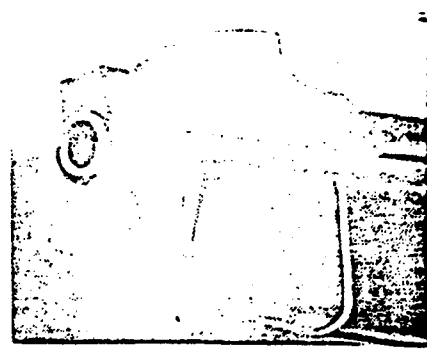




With the stock removed, the trigger adjustment screw is revealed. It appears to be pre-set at factory, then "glued" into place for a light pull.



Adjustment of rear sight is accomplished with this Allen wrench packed with the gun. Mount at rear of sight was installed for Bushnell Phantom.



Similarity of XP-100 front sight, fore end to that of Remington's Nylon 66 .22 rimfire rifle is beyond coincidence. Rib is added feature.

their ballistics figures. However, this trend seems to be changing with more realistic figures resulting. We take partial credit for this, since we have been among the publications that have frequently discounted these velocity claims through actual field testing of suspect loads.

Next, we took our battered old plate of quarter-inch boiler plate out to fifteen yards, and fired one of the *Fire Ball* rounds through it. It cut a neat plug about the size of a .38 case out of the metal. At twenty-five yards, then fifty yards, the gun did exactly the same.

Finally, at seventy-five yards, the bullet failed to get completely through the heavy plate. However, it pushed a blister into the metal that was cracked all the way around on the rear side. A hard tap with the end of a screw driver would have pushed it out.

Digging around in the sand backstop, we managed to come up with a pair of the spent bullets, which no longer resembled anything like their original form. They had been turned completely inside out, the metal flattening out to turn back over the copper jacket.

Some of the statistics on the .221 *Fire Ball* no doubt will prove of interest to those who are looking for a hotter load. This round has a 50-grain jacketed bullet, and the speed is close to that developed in the much publicized .22 Hornet handloads launched from a rifle. Muzzle energy is 780 foot pounds at the muzzle. Even out at three hundred yards, the bullet still is moving at 1460 feet per second, although energy drops to 235 pounds at that range.

For the handloading buffs who'll be checking this one closely, the approximate case length is 1.395 inches, or about twenty-five percent shorter than the .222, which has this same basic case. The *Fire Ball* is about nine percent longer than the Remington .22 Jet, according to Cotterman, who'll be reloading this one for our next issue. He judges case capacity should be 21-22 grains of ball powder.

After the plate puncturing exercises, we turned our attention to the matter of accuracy. Since this wasn't meant to be a target gun for offhand shooting, we set up half a dozen yellow-shaded clay pigeons at seventy-five yards, then drew up a table and began to plink away, shooting from the sitting, braced position. The scope had not been bore-sighted and required fifteen minutes of adjustment before the bullets began to shatter the targets. We had selected the clay birds, incidentally, since they seemed to approximate the size of a bobcat's head.

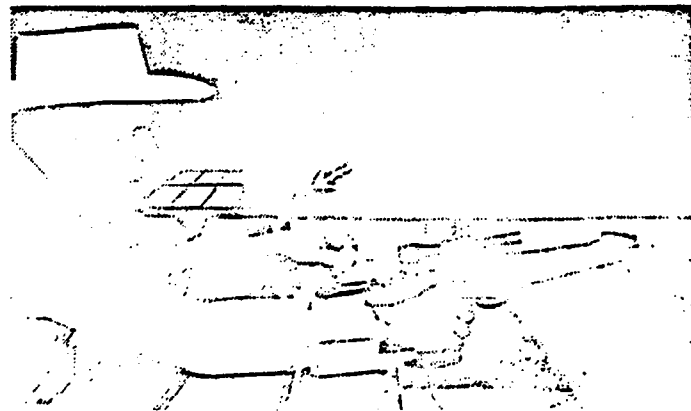
Most of us hit some and missed some, but the full potential of the gun proved itself in the hands of Duke Roberts, who sat down at the bench, rested the XP-100 in a two-hand hold, then began to knock off targets one after the other. Then to prove himself, he began to chop up the lesser pieces that still showed yellow against the sand. At seventy-five yards, yet!

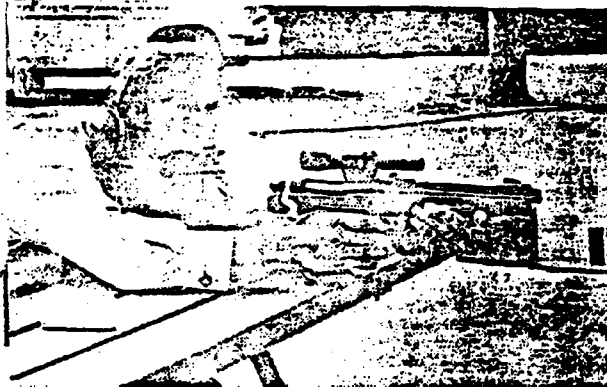
This, of course, is fine on a range under controlled circumstances, but what about varmint shooting for which the gun was designed?

We turned the gun over to Jerry Mills immediately after the range work and he made for his favored

GUN WORLD Editor Jack Lewis pulls the bolt to the rear to eject the fired case with a crisp, positive action. Handgun is well balanced for weight, packs big punch at

distances as evidenced by holes in quarter-inch boiler plate at lower right. Hole which did not completely perforate the metal was fired with *Fire Ball* at 75 yards.





GUN WORLD Publisher Rich sights in with fore end only balanced in palm, holding loosely. Photo at right shows



the recoil of the XP-100 upon firing. Note that the muzzle is elevated, but the gun seems to rock back on its butt.

corner of the country, where the states of California, Arizona and Nevada merge.

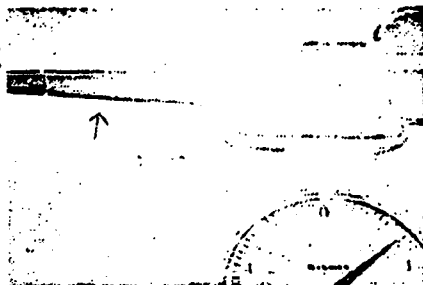
Mills began calling early in the morning, at about seven o'clock and reported that it only took about fifteen minutes to lure in a bobcat.

With the handgun braced against his knees, he spotted the animal at about sixty yards out, lined up the scope and squeezed off the first round. That was all it took. The bullet hit the cat on the point of the chin, shattering the entire bone structure of chin and jaw, then went on to sever the spinal column.

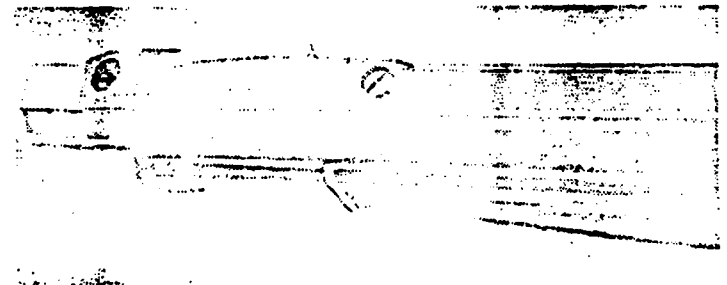
In range tests, Jack Miller had commented that the grip of the gun seemed to fit his hand as well as any standardized stocks: he has a large hand. Mills' hand is smaller, but he also felt that holding was excellent. All of which means that some gains have been made toward the sought "universal" grip. At the opposite extreme, Roberts complained that the back of the grip seemed to cut into his palm, making it uncomfortable for a tight hold.

One comment made by all hands is that with the gun balanced as it is, there is comparatively little

When plastic stock of handgun was removed and weighed, it was found to scale in at exactly 11 1/4 ozs. Note holes for insertion of lead weights.



The ventilated rib, which runs full length of the XP-100's barrel, has both sights mounted upon it. The rifle type sights give one a feeling of confidence in the arm's potential for distance shooting even without scope. Rib is matted to discourage light glare. Scope rides above rear sight.



Above: Reloading dies for the .221 Fire Ball already are in production by RCBS, although cartridge isn't yet released. Right: Dan Cotterman checks out this new round, comparing characteristics for next month's reload test.

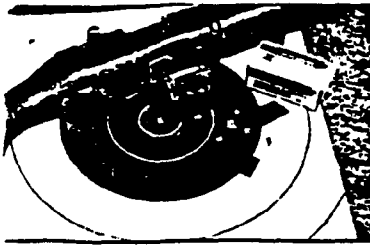


The range testers felt that, while the trigger pull on the gun was excellent, it might be a trifle too light. Mills, at the opposite extreme, appreciated the light touch required to send the firing pin forward. He feels it has a definite advantage in varmint shooting, where the animal is not going to linger.

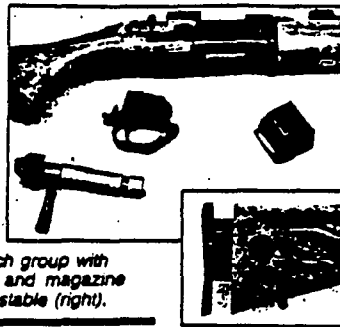
For years, buyers have been prejudiced against the use of plastic in firearms, but in recent years, the breakthrough apparently has been made on this emotional barrier, and sales are up. This could have a major effect in making the XP-100 a popular handgun, and its accuracy is certain to help.

Meanwhile, in our next issue, Jerry Mills will be doing more serious varmint hunting with this one, and Dan Cotterman will be investigating the reload facets. Be sure to watch for this progress report. ●



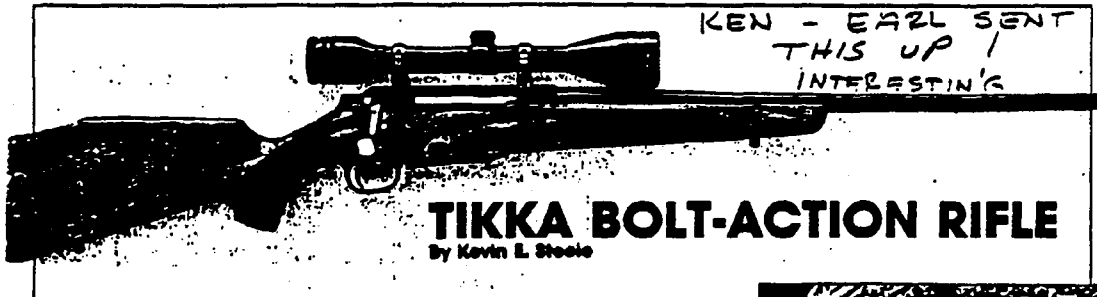


The Daisy 2202 repeater gave this  $\frac{1}{4}$ -inch group with Winchester ammo. Trigger assembly, bolt and magazine are easily removed; synthetic stock is adjustable (right).



This was no problem with Long Rifle ammo, but when some .22 Short loads were tried it took a little practice to get used to loading the tiny cartridges with my grown-up fingers. I doubt that this would be a problem for the average youngster. The Short ammo, by the way, gave groups twice the size of most Long Rifle loads from the rifle.

Although care should be taken in selecting ammunition, these pint-sized rimfires are attractively styled and very reasonably priced. A Daisy rifle, under proper supervision, would be an excellent way to introduce a youngster to the shooting sports.



## TIKKA BOLT-ACTION RIFLE

By Kevin L. Steele

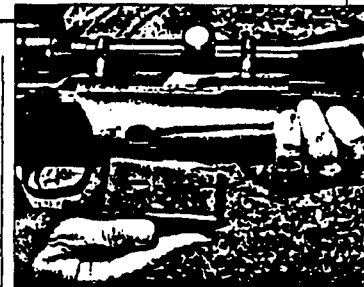
The Finnish firm of Tikka has been producing firearms since 1918. Now owned by Sako, the independent Tikka plant was recently closed and production of Tikka rifles was moved to the Sako facility at Riihimäki, Finland. Stoeger (U.S. Sako distributor) is presently offering the new Tikka bolt-action rifle for sale here in the States. The Tikka rifles are not poor cousins to the Sako rifles; in fact, the new Tikkas feature several innovative design points that are truly unique.

Older shooters may remember that Ithaca's LSA-55 and 65 rifles, available from 1969 to 1977, were in fact Tikkas. These guns, which possessed a good reputation for quality, were in effect Mauser-style sporters. While the new Tikkas also share a Mauser heritage, they are an interesting and practical blend of old and new, and the best example of this is the guns' dual-lugged, front-loading bolt that rides within a high-strength polymer sleeve enshrouded by the rear receiver ring. This snug-fitting sleeve effectively eliminates lateral bolt "wobble," a short-coming long associated with the Mauser-type actions. The new Tikka's bolt throw is indeed silky smooth; in fact, I can honestly state that this is the smoothest Mauser clone I have ever worked. However, as to the sleeve's extended durability I cannot testify. Also, like most copies of the '98, the firing pin is cocked upon bolt lift.

The bolt body itself is of one-piece

construction, and the metal is finished bright. The face of the bolt enshrouds the case head, and the extractor is of the spring-loaded type in league with a plunger-type ejector. The bolt handle acts as a third or "safety" locking lug.

The stockwork on the standard rifle is somewhat understated, but quite functional. The European walnut is straight-grained and dense, finished to a dull satin sheen. Machine-cut checkering, run-



Tikka's new bolt rifle features a detachable box magazine using a synthetic follower and floorplate.

### SPECIFICATIONS

TIKKA BOLT-ACTION RIFLE	
Maker:	Sako, Riihimäki, Finland
Distributor:	Stoeger, Inc., Dept. GA
Address:	55 Ruta Court, S. Hackensack, NJ 07606
Caliber:	.30-06 (223, 243, 270, 7mm Mag, .338 Win. Mag)
Action Type:	Bolt repeater
Magazine Capacity:	3-round detachable box (5-round optional)
Barrel Length:	22.4 inches (std. calibers); 24.4 inches (magnum calibers)
Weight:	7 pounds (short action); 7.5 pounds (long action); 7.5 pounds (magnums)
Sights:	Integral dovetail scope mount bases
Stock:	European walnut, satin finished
Price:	\$540

ning about 18 lines to the inch, is applied in opposing panels on the sides of both grip and fore-end. The pistol grip also features a slight Wundhammer-type swell on the right side, while the butt-stock sports a high Monte Carlo comb. The butt is capped by a rakishly contoured, dense-plastic foam recoil pad.

Modern technology is also evident in the abundant use of high-impact polymer parts elsewhere than the bolt sleeve. These parts include the triggerguard/floorplate and bolt shroud, along with the detachable box magazine's well, follower and floorplate.

Available in two action lengths, the short and long-action rifles intended for non-magnum calibers are fitted with hammer-forged, 22.4-inch barrels. Mag-

## PROOF HOUSE

num-caliber guns feature 24.4-inch tubes. The receivers are forged and milled from steel, matte finished to reduce glare, and feature integral dovetail bases to accept scope rings. Barrels are blued and polished, but in a dull manner—not from a quality standpoint, but to produce a more utilitarian finish. Overall, the new standard-grade Tikka presents a durable "working" rifle image.

While our sample rifle was a standard-grade gun, Tikka also offers a more deluxe variant with a select walnut stock featuring rosewood fore-end and grip caps. The Monte Carlo comb on this gun is of the more aesthetically pleasing roll-over type, and the barrel is highly polished and deeply blued.

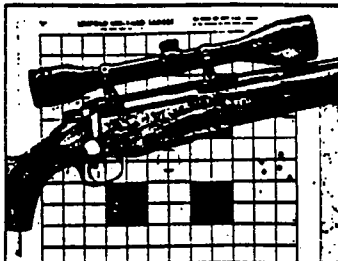
For our range evaluation, we fitted the Tikka rifle with Tasco World Class rings into which we set a Redfield compact 4X

scope. The rifle was chambered for the uncompromised .30-06 Springfield cartridge, so we rounded up an array of factory ammunition that included loads from Winchester, Remington and Norma, and headed to the range.

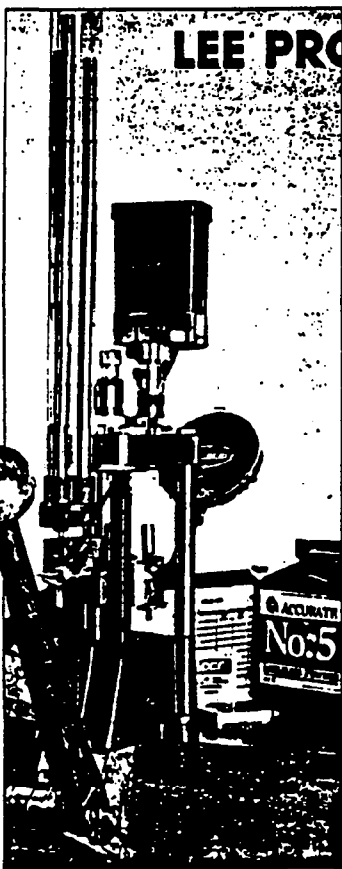
Our firing tests showed the new Tikka capable of delivering excellent hunting accuracy with bullet weights that included 150, 180 and 200 grains. Our best group

ran .870 inch with the Norma 200-grain fodder, and the average size of all groups fired was a very acceptable .928 inch.

The new Tikka offering is a high-quality bolt gun utilizing lightweight, durable space-age components. If you're looking for a tough hunting rifle that should stand up to rough use, I'd seriously consider the Tikka. See one today at your local dealer.



From the bench, accuracy proved more than acceptable. Using a variety of .30-06 factory loads, groups averaged .928 inch; best group measured .870 inch.



## LEE PRO 1000 PROGRESSIVE LOADER

By Bob Forker

More and more shooters are getting involved in some type of organized competitive shooting. The common thread of all these events is that they burn up lots of ammunition. As the need for quantity reloading has increased, the availability of good progressive reloading tools has kept pace. I'm not talking here about the all-up, powered, assembly-line type of machine. There are very few shooters who can afford, or even want, that type of tooling for their personal use. For my money, it's the automatic, hand-operated tool with a production capability in the 500-round-per-hour class that best fills the individual shooter's needs.

Lee Precision's Pro 1000 progressive reloader nicely fits into this category. This reloader is unique in that Lee has chosen to use what's sometimes called the systems approach to its design. Instead of restricting the design of the press entirely to standard dies and accessories for regular "non-progressive" reloading, they've come up with a press that from the ground up is designed for the progressive job. The result is an easy-to-use, compact reloader that's loaded with features to make the job easier and better.

The Pro 1000 is a "three-holer" (just three stations in the turret). With only three stations to watch, it's easier to keep track of what's going on. While it isn't all that hard to do it right, there are several ways you can mess up any re-

loading operation, whether manual or automatic. The major mess-ups generally come from either forgetting or not completing some step in the operation. The Pro 1000's design helps guard against some of these annoying glitches. For instance, the press won't throw a powder charge unless there's a case in place to receive it. If you've ever accidentally thrown a charge into the innards



Empty cases are automatically fed from the feed tubes at upper left. Case to the right is about to be primed.