

THE AMERICAN RIFLEMAN'S MAGAZINE



VOL. LXIX, No. 5

NOVEMBER 15, 1921

Peters Ammunition sure does put pep into shooting! You find yourself making real scores instead of the hit and miss stuff! Peters Ammunition is the best you can buy!

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THE .22 caliber rifle shooter insists on the highest degree of accuracy, not only from a sample lot of ammunition, but also from every box he buys subsequently.

The new Remington .22 Long Rifle PALMA cartridge has been developed through extensive research work and intensive refinement in manufacturing methods. Any box of it purchased from any dealer is capable of giving you, when shot from a good rifle, groups equalling the ones shown on this page. These ten-shot groups—by the way—were shot *in succession* at 25 yards, using cartridges from different lots selected at random from the factory stock-room. Each group would be a good possible on the half-inch ten-ring.

Mr. P. E. Lahm shooting in the Small Bore Palma Team Match at Sea Girt this year established a World's Record for the Small Bore Palma course, with a score of 224 out of 225, using the new Remington .22 Long Rifle PALMA cartridges. Capt. F. G. Bonham, U. S. A., also used this ammunition in winning the Small Bore Wimbledon at Camp Perry with the remarkable score of 99 out of 100 for 20 shots at 200 yards. Seven members of the 1921 U. S. Dewar Team used the .22 PALMA cartridge.

Pistol experts will be very much interested in the score of 478 out of 500, shot October 13th, 1921, by Alfred P. Lane, in the U. S. R. A. Outdoor Pistol Championship. This ties the World's Record for match shooting made by George Armstrong in the same match in 1918. Mr. Lane used the new Remington .22 Long Rifle PALMA cartridge.





The Official Organ of the National Rifle Association of America

Volume LXIX, No. 5

WASHINGTON, D. C., November 15, 1921

\$3.00 a Year. 15 Cents a Copy

Concerning the Strength of the Springfield

By MAJOR J. S. HATCHER

PART II

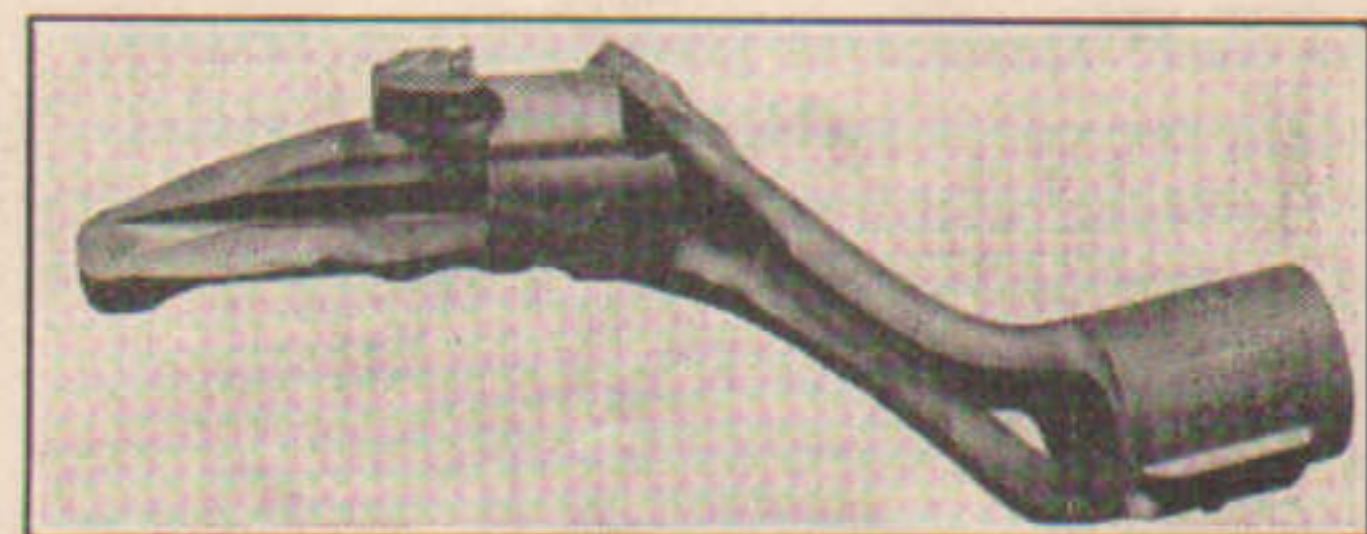
NOW that we have disposed of the barrel, let's consider the action. I received a letter the other day in which the writer inquired about the strength of the bolt. He stated that he had read in a magazine that the Springfield bolt was much weaker than that of the Krag, and that the Springfield bolt was dangerous because of a tendency to blow out of the rifle, which the Krag would not do. Of course anybody who has any conception of rifle construction knows that the Springfield bolt with its double lugs is far stronger than the Krag bolt with only one lug. I think the magazine must have gotten its statement reversed, for it is certainly opposite to the facts. For a good many years most of the rifles damaged in service have been returned to Springfield, and as far as I have been able to find out, no one has ever seen a case where the bolt was actually blown out. I have heard people speak of cases where the "bolt blew out" but investigation or closer questioning

to one-half that amount, and firing tests were conducted with both service cartridges and high pressure loads with no evil effects. The lugs were then reduced in thickness to one-tenth of an inch, or one-fourth of their original dimensions. Shots with service cartridges caused no trouble, but a 75,000-pound blue pill broke off the weakened lugs. Still, the safety lug held, and the bolt did not move. This test indicates that the lugs on the bolt are about four times as strong as necessary to hold the service cartridges.

Still, this test did not satisfy me. I thought I might as well find out exactly what the safety lug would do by itself, so I took another condemned bolt and removed both lugs. The service shot crushed the safety lug slightly, but did not move the bolt. The high pressure shot sheared off the metal of the safety lug which was already crushed, and allowed the bolt to move back slightly. However, the bolt did not move far, for the



Above: Effect of a soft cartridge on a 1919 match rifle. The bolt, barrel and receiver were uninjured, and the damage from gas was confined to the stock and other parts. Right: A receiver of old manufacture, brittle and broken from a blow. Left: A receiver of new manufacture which will not break, but bends when tested. These receivers will stand almost unbelievable pressures.



has always shown that the statement was not accurate. I have never been able to run down one authentic case.

In some of the bolts made years ago, before the new heat treatment was established, lugs have been known to crack off, but in all cases the safety lug held the bolt from actually coming back. Just how strong the lugs really are in relation to their normal load was very well shown by a recent experiment in which a condemned bolt, barrel, and receiver were used. The lugs of the bolt, which have a standard length of four-tenths of an inch were reduced

safety lug sheared off at an angle, and the remaining part wedged under the right-hand wall of the receiver, bringing the bolt to rest after it had moved back about half an inch. If a bolt with the locking lugs entirely removed requires a blue pill to move it half an inch, the regular bolt, with all its lugs, must be pretty safe.

The next subject, and perhaps the most important one of all, is the strength of the receiver. A broken receiver makes a bad mess, and once in a while we do see cases of this kind. It was in the spring of 1917 that I first came

actively into contact with the question of receiver strength. I had just come to Springfield Armory from the Mexican border, and had been placed in charge of the experimental department, where one of my first duties was to examine two burst rifles and report on the cause of the trouble. Both rifles had failed while using a certain make of war-time ammunition. This, on the face of it, pointed to defective ammunition as the cause of the trouble, but only a cursory examination of the steel in the receivers was required to show that it was coarse grained, weak, and brittle. I reported that soft cartridge cases had probably contributed to the failure, but that the real underlying cause was poor steel in the receivers. At first this report was received with marked skepticism. It was argued that the Springfield rifle had been used for years with no complaints, and that as both accidents had occurred with the same ammunition, the cartridges were to blame. The answer to this was, that aside from any fault in the cartridges, the steel was susceptible to marked improvement, which should be made in order to have the rifle safe even for bad cartridges. Colonel Peirce, commanding the Armory at that time, very strongly endorsed this view, and in addition to obtaining a competent metallurgist to work on the subject, ordered the experimental department to find out all it could about the matter.

One of our first steps was to try the effect of soft brass in the cartridge case. To do this, we took out the bullets, powder, and primer from a number of cartridges and annealed the cases, thus making the brass very soft. We then reloaded these cases and fired them. We found at once that they were far more dangerous than the high pressure cartridges. When they were fired, these soft cases would spread out at the back end or give way entirely, letting the gas at high pressure out into the receiver, with disastrous results. When gas at 50,000 pounds is pressing on the inside of the barrel, it does not have much surface to work on, and the total pressure is not great, but when it gets out into the bolt-well of the receiver, whose diameter is about an inch, it has more surface to push against, and the total pressure is much greater. A cartridge of this kind will burst a weak receiver, and even if the receiver is too strong to be injured, escaping gas is likely to do damage of other kinds, such as blowing off the extractor, splintering the stock, or blowing out the magazine floor plate. An extreme case of this nature is shown in the cut, which represents the effect of a soft cartridge case on a 1919 National Match rifle in which the receiver, bolt and barrel were too strong to be injured.

Besides soft cases, we tried the effect of high pressures. As the rifles were constructed at that time, the average gun would stand about 80,000 or 90,000 pounds.

A study of the subject by the metallurgists showed that the receivers were made of steel fairly low in carbon. In order to give them a good wearing surface, the receivers were case hardened by heating in charred bone and then quenching. Theoretically, this treatment should give the metal some hardness all the way through, but the greatest hardness should be on the surface where the additional carbon had soaked in from the case hardening. Practically, the method was full of inaccuracies, and it was easy to make a receiver brittle either by leaving it in the charcoal too long or by heating it too hot. In order to understand the beautifully scientific, yet simple, way in which this difficulty was overcome, it is necessary to know the principles of heat treatment. Steel which contains the proper proportion of carbon can be hardened by heating it above a certain temperature called the critical point, and then quenching it in oil or water. When high carbon steel is treated in this manner, it becomes glass hard, and for most purposes is too brittle. In order to toughen it, some of this excess hardness must be removed by again heating it slightly. As this secondary heating progresses, the steel loses more and more of its hardness, until just before the critical point is reached, it is dead soft. This second heating is called tempering or drawing, and by stopping this process at the right temperature, the steel can be given any hardness desired. This hardening and drawing process refines the grain of the steel and makes it much stronger, even when all the hardness is removed by the secondary heating. Two other points to be remembered are that low carbon steel cannot be made as hard and brittle as high carbon steel can, and that high carbon steel has a critical point lower than that of low carbon steel. With these points in mind, the reason for our receiver treatment and its effect will be plain. In the first place, the receiver is made of low carbon steel, which is naturally soft and tough. After the receivers are made up, they are carbonized on the outside, by heating them in an atmosphere of carbon-bearing gas. This makes the outside surface into high carbon steel for a thickness of from one-thirty-second to one-sixteenth of an inch, while the central part or core, which the carbon from the gas has not had time to reach, remains in its original low carbon state. The critical point of the core is perhaps 1,450 degrees, while that of the high carbon skin is about 1,375. The piece is heated to, say, 1,475, which is above the critical points both of the surface and the core, and is plunged in oil. This hardens the whole receiver, through and through. Now it is heated to 1,400. This is *above* the critical point of the outside skin, but *below* that of the inside core. The piece is again plunged. The outside part, which was

heated above its critical temperature, becomes glass hard, while the core, which was heated below its critical point, refuses to harden. Of course, the core is hardened by the first quench, but the second heating removes all this hardness and leaves this part dead soft. The quenching and reheating also refines the grain and greatly increases the strength. What we finally have is a receiver with a soft, tough core that cannot be broken, and a very hard skin that stands use without wearing. The qualities of this receiver are very well demonstrated by a test to which one sample out of every lot is subjected. It is fastened into a vise while a workman takes an iron bar and attempts to break it off by striking it a heavy blow on the weak section over the magazine well. The receivers made before 1917 will fly to pieces like glass when they are treated in this manner, while the new receivers can be bent almost double without breaking. As the receiver bends, the hard skin becomes covered with hairline cracks, but the brittle qualities are all on the surface, and the hardness fades away rapidly towards the center core, which is so soft and tough that it simply will not break.

After this treatment was developed, we subjected the new receivers to every ballistic test we could think of. After we had used up the highest high pressure shots we had, we made up new ones by filling up the case with powder and driving it down and again filling the space. Finally, we had to get faster powders to make higher pressures and still we could not burst the receivers. One of the loads we used was 45 grains of bull's-eye. We went to 80, 90, 100, 110, 125, and 130 thousand pounds, and did not rupture barrel, bolt or receiver. The higher pressures would practically melt the rear end of the cartridge away, and usually the escaping gas would blow off the extractor or splinter the stock, but would not burst the gun.

Right here I had better explain that the new heat treatment was also applied to the bolt, with the complete elimination of broken lugs. With very high pressures the thin rim of the bolt, which goes around the head of the cartridge, sometimes breaks off, but this would not endanger the shooter.

Since the new heat treatment has been adopted in 1917 we have made about 500,000 rifles, and out of these rifles no burst receivers have been reported. The new treatment started with guns numbered about 800,000, and when guns are repaired at Springfield Armory, receivers with numbers earlier than this are either scrapped or retreated. The old receivers are *fairly* safe, but the new receivers are invincible, and I believe that the Springfield rifle, as it is manufactured today, has a factor of safety unsurpassed by that of any other high powered arm.

Make Your Range Attractive

By MAJOR TOWNSEND WHELEN

The second of a series of papers to appear previous to and during the Indoor Match Series of 1921-22 from recognized authorities on indoor shooting. The author of this paper needs no introduction to ARMS AND THE MAN readers and among the new ideas which he presents should be many helpful hints toward making this year's matches a success.—The Editors.

PERHAPS some of the following hints and thoughts may be of help now that the gallery season is on, and riflemen are getting their galleries and shooting kits in shape.

A matter that is always a very vital one is the lighting of the gallery. The best-lit targets that I have ever seen had two 40-watt lamps on either side of the bull, and about one foot to the side of the bull, and about two feet in front, like the sketch shown here. The wood frame on which the lamps were mounted was painted with white enamel so as to help reflect the light on the targets. This method of lighting seems to be very much better than where the lights are placed below or above the targets, and does not tend to make the bull's-eye become gray when one aims with the front sight close to it.

The whole of the target end of the gallery should be painted a light, dull gray, or a light buff, so that the sights can always be seen outlined against the wall and surroundings, but not so that it will reflect light in the eyes. The worst color of all to paint the wall back of the targets is black. You can then only see your sights when they are against the target itself, and it often takes a long time, and a lot of poking around, to get aligned on the target. Also as the aperture of the rear sight usually takes in more than the target when you aim through it, if the target surroundings are black it is practically impossible to define the edges of the aperture, and you never know if you are surely centering the front sight in the middle of the peep.

There should be no lights in front of the firing point except those lighting the targets, which of course are shielded from the shooter's eyes by the frame on which they are mounted. The firing point should not be brilliantly lighted, but yet it should not be so dark that the shooter can not see to handle his equipment. A good plan is to have several red lamps behind the firing point—say, one to every two firing positions. Portable electric battery lamps should be provided for the shooters to use in setting sights and looking at the elevation and windgauge scales on the rifles.

Every man does not come to the gallery equipped with old clothes to shoot in, nor is it always convenient to change clothes. Particularly new men and prospective mem-

bers will not have shooting clothes, and these are just the men you want to interest and make come again. Therefore make it convenient, comfortable, and easy for the new man to shoot whenever he comes around. One of the first requisites is a clean and comfortable firing point—one that will not injure good clothes, and that will permit a steady, comfortable shooting position. Pay particular attention to the prone benches, or to the floor if you shoot prone off the floor. I do not like a mattress to shoot on. It is too soft, almost always too narrow, and one slides around too much on it. It is almost invariably filthy dirty. Also I have known of several

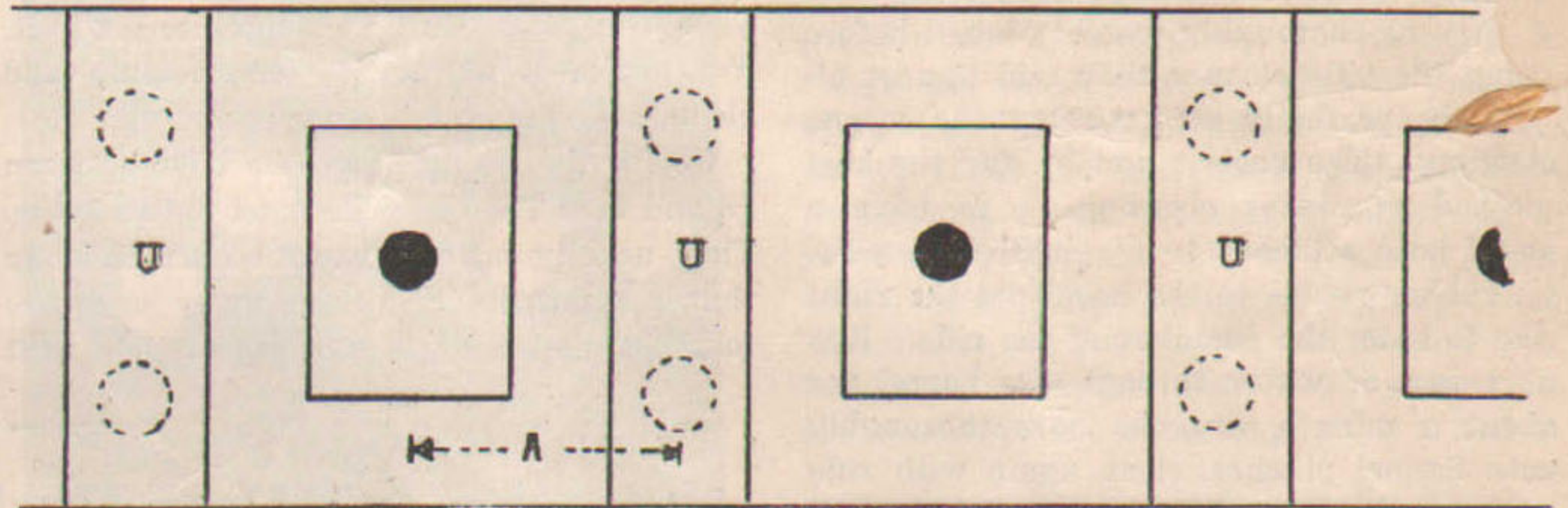


Diagram of Range Lighting System

mattresses to catch fire from the flash and burning powder from the muzzle of the rifle. The best arrangement is to have that portion of the bench or floor on which the body rests about two inches higher than that below the elbows. On the lower portion provide a clean rope door mat for the elbows to rest on. Sew tabs on these so they can be hung up on the wall when not in use. If any trouble is had in keeping the firing points spotlessly clean have canvas tarpaulins to lie on. Make them of white canvas, 6 feet by 5 feet, with grommets at two corners so they can be hung up on nails when not in use, and stencil on them the words "FEET OFF—KEEP CLEAN." The caretaker can beat the mats and tarpaulins every day to keep the dust and dirt off, or can wash them when necessary.

There should be a really good shooting kit provided for the new or prospective members. Of course, the old members and the cranks will own their own rifles, without which they could hardly be called real riflemen. But the new men will hardly feel at home unless you can assign to them a really good rifle for the evening, one with which they are not handicapped in any sense. When they use it they should not feel that they are keeping someone else from shooting. It has always seemed to me that the new man always liked it much better if he shot alongside the old member

who brought him around, than if he shot the old member's rifle while the latter stood around waiting for him to get through. The N. R. A. recognized this state of affairs when they provided a free issue of two gallery rifles to each club. These are to enable the club to get started and for new members. All the members who have progressed to the point where they have become riflemen should have their own rifles which they believe are just a little bit better than any others in the world. The club rifles should be good ones. See that they have the very best sights, good trigger pulls, and proper gunslings. Find out their correct sight adjustment and record it on a tag attached to the rifle. The member who takes a club rifle out of its rack should be responsible for seeing that it is put away perfectly cleaned at the end of the evening, but if it is to remain in perfect condi-

tion there should be a caretaker or someone else to clean it again the next day.

There should also be wooden cartridge blocks available for everyone, because it is difficult to count cartridges out of their boxes at the semi-dark firing point, and one is very liable to loose count of how many shots he has fired at the target. These cartridge blocks are simply blocks of wood that have holes bored in them for twenty cartridges in rows of five. Have rifle rests, too, for one's arm gets very tired holding a rifle up through a long series of shots. The rifle rest used on the outdoor range will not do, for there is no dirt to stick it in. Make it of heavy wood about seven inches high, and nail it to a box about four inches high. Fill the box with a couple of bricks to make it heavy, and place it in front of the firing point. Telescopes will be needed also for those who are not equipped with telescope sights, so they can spot the shots on the target. A high-power telescope is not necessary. Ten power is high enough, and such telescopes can usually be purchased very cheaply. A cheap one is as good for this purpose as the most expensive one, but be sure that it will focus correctly at 50 or 75 feet, as many of these will not focus for distances less than 100 yards. Mount these telescopes on heavy wood blocks, 12 inches high, so that the scope and block can simply be taken out and laid on the firing point alongside

the shooter. A wood wedge under the block will serve to raise one end or the other so as to get the scope trained on the target.

Have a good cleaning rack, and provide all the necessary materials: first-class cleaning rods of spring steel that will stand the racket and remain straight; flannel cleaning patches of just the right size for the rods, and plenty of them; wiping rags of bird's-eye or diaper linen. Plenty of rifle cleaner and lubricating oil; and an acetylene lamp or gas jet for blacking the sights.

There is one rub, however, about cleaning gallery rifles. To insure their keeping in perfect condition it is almost absolutely necessary, not only to clean them the evening they are used, but again on the following day. This when cleaned in the usual manner. But shooters usually want to leave their rifles in their lockers at the club, and may not return again to clean them for a week or more. However, I have found that if they be thoroughly water cleaned before using the rifle cleaner they will almost always be perfectly safe without the second cleaning. The easiest and by far the best method of water cleaning is to have a small hose attached to a spigot, with a little rubber nozzle to the hose just the right size to enter the chamber of the rifle. Run a stream of water through the barrel for about a minute, dry the bore thoroughly with flannel patches, clean again with rifle cleaner, wipe perfectly clean and dry a second time, then swab well with rifle cleaner, and put the rifle in the locker. Next week it will be in perfect condition if the gallery is anywhere near dry. Some galleries are in damp basements, and rifles kept in them will rust no matter what you do.

By all means have a clubroom in connection with the gallery, and make it attractive. Particularly have comfortable chairs. There is no excuse for a chair that is not comfortable. Get the big-game hunters of the club to hang their trophies on the walls. One clubroom that I lately visited had one end hung with the finest little collection of flint lock rifles that I have ever seen. Have a corner devoted to dope for the beginner, with good pictures of the various firing positions, instructions about sight adjustment, trigger squeeze, care of the rifle, etc. Of course there should be a bulletin board for announcements, and for the standing of members and the club in the various matches.

It is a good idea, too, for the club to have its own 80 per cent and 90 per cent medals, and to have them available so that they can be presented to a new or prospective member the same evening that they are won. There is nothing that encourages the new man so much as winning his first medal. You see I lay special stress on encouraging and interesting the new member, because it has been the experience that most clubs are really only half alive, depending en-

tirely on half a dozen cranks, and with their rolls padded with a lot of deadwood. One of the best clubs that I know of caters in these ways to new members, and they have a surprising number of really active shooters. As a consequence they are very prosperous. They own their own building, a city dwelling, with an unusually long cellar. Their caretaker lives on the premises, and they rent the two top floors as bachelor apartments, thus bringing them in a nice income. Suppose your house costs you \$10,000. You rent five bachelor rooms at \$30 a month, which makes an annual income of \$1,800. This will easily pay the interest on your investment, your light, heat, and taxes, and also let you accumulate a little sinking fund. The annual dues, sale of ammunition, entrance fees in matches, etc., will take care of everything else. This is the best way to get a good gallery and clubroom that I know of. Once you own your own place you take some interest in it. You make it attractive, convenient, and clean, and your club prospers.

Go for the young men—the boys between 18 and 22. They are the most enthusiastic. They usually have not formed attachments that prevent their getting away evenings to shoot, and a large majority of them will

stick even when they get older. Usually the Y. M. C. A. is a good place to go recruiting. Also look up the boys that belonged to the Boy Scouts, but who have passed the age limit of that organization. Have a Boy Scout Night for the youngsters, and get the nearest troops to come around. A couple of your older members will usually be only too glad to act as instructors. See also if there is not a W. J. R. C. Unit in the vicinity, and entice them to use the range on some other evening. Have cards printed advertising the club and its conveniences, and see that all the salesmen in your sporting goods stores are provided with a supply of them to give to rifle purchasers. Get the store that supplies you with ammunition to tie one of your cards to every rifle they sell. It will help them and you, too.

Get a hustle on this winter and make your gallery range boom. The N. R. A. has provided the finest line of gallery matches ever, and these will keep you shooting steadily from December to April with lots of incentives. After that you will move outdoors to your small-bore range, and before that time comes I hope to have some more notes which I hope will help to point the way to success throughout the spring and summer months.

War Field Glasses

W. S. DAVENPORT

MANY of the enormous number of field glasses made for use in the war are being sold to sportsmen. The advertisements of these glasses do not contain all the data needed to define their general optical qualities. The magnification is stated and the diameter of the object glasses, but the apparent field of view is not, nor does the average purchaser calculate the size of the exit-pencil by dividing the diameter of the object glass by the magnification. The apparent field of view and the exit-pencil, together with the magnification, determine the optical qualities and all three should be known to the intending purchaser of one of these advertised field glasses.

The apparent field of view is the field a glass would show if it did not magnify. It is what is seen when we look through a round hole cut in a piece of paper that is held before the eye. It is the size of the circle of light we see when we hold a glass to the sky. We can not express this size in inches because the same hole looks larger when held nearer to the eye. It must be expressed as an angle, either in degrees, for instance, 48 degrees, or in the number of yards of fence shown running across the field at 1,000 yards distance. For an angle of 48 degrees this would be 900 yards of fence.

If we put into the hole in the paper a magnifying system that enlarges six diameters, we shall see only 150 yards of fence or an angle of 8 degrees. This is the actual field of view. If with the same size hole of 48 degrees we have a magnification of 8 diameters we shall see only 6 degrees of actual field while of course the apparent fields of the two glasses are alike.

Field glasses differ widely in the size of the apparent field. In the old style Galilean glass, which has a concave eyepiece to erect the image, this field is small. It may range from 14 to 25 degrees. It is smaller in the higher powers. One sees a smaller circle of light in a 7-power Galilean glass than in an opera glass of 2-power. We can make a rough guess at the size of the apparent field of a Galilean glass by noting the looks of it when focused. If the distance from the eyepiece to the object glass is short and the object glass is large in diameter the apparent field is larger than it is in a second glass that is longer or has smaller object glasses. We should note the outside angle whose apex is in the eyepiece and whose sides pass through the edges of the object glass.

In prism glasses the apparent field of view is usually between 40 and 50 degrees.

(Continued on page 8)

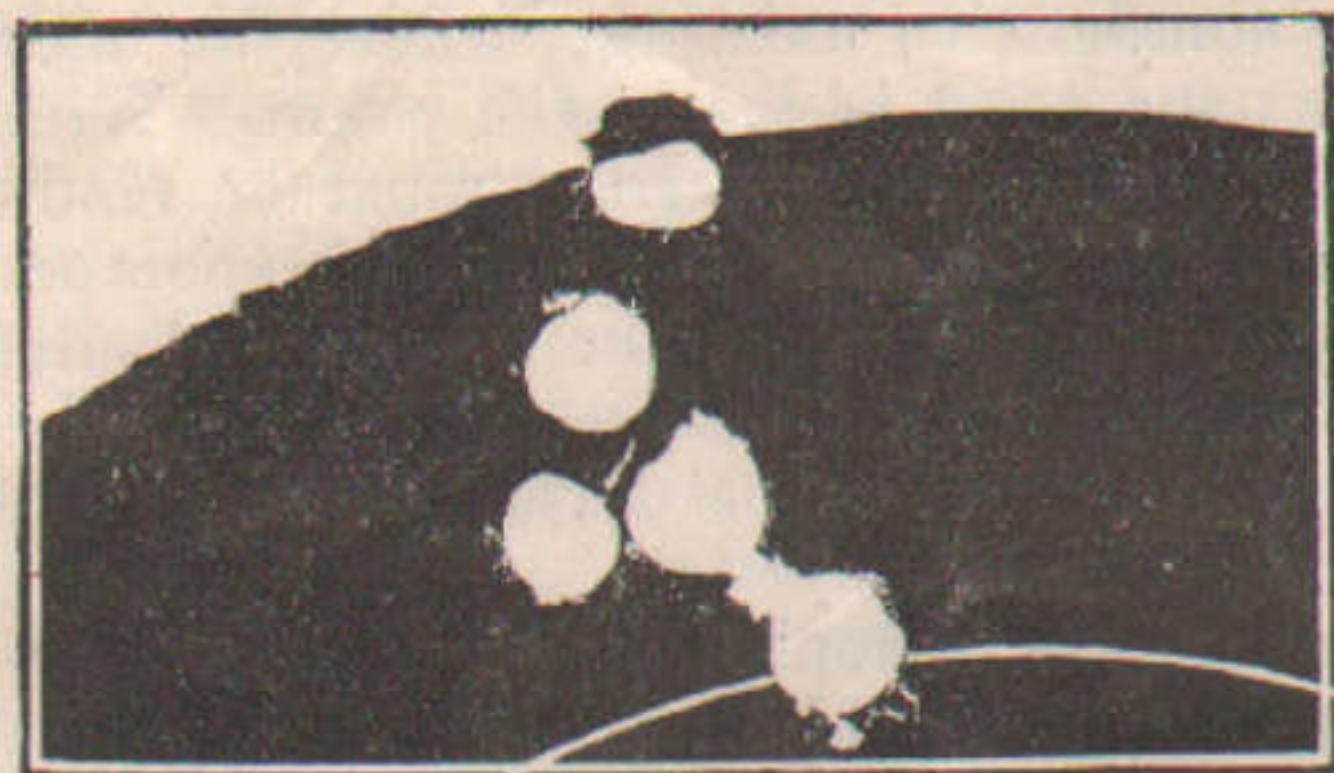
Shotgun Powder for Reduced Loads

By M. B. PAINE.

DURING the past six months the writer has given considerable time, thought and effort to reduced load experiments with high-power rifles. The Springfield, the Mauser, the Styer, the 250-3,000-bolt action Savage, in the course of test firings have been fed all manner of powder-and-bullet combinations to the end of settling upon a charge which would show the maximum of accuracy at a minimum of expense in practice over short and medium ranges.

As a result, a load which is very accurate up to 400 yards on a still day and which registers possibles on the 1-inch bull's-eye at 50 yards, was developed. Best of all the actual cost of 320 cartridges was \$3.32.

I have followed for a long time the valuable data in ballistics and rifle work as set forth by Colonel Whelen in his *American Rifle*, and also in your valued columns each month. We have carefully carried out a great many of his experiments and have found some data that will be of great interest, no doubt, to many rifle cranks looking for the same thing that we have been looking for, accuracy and ease of manipulation in the firing of these rifles spoken of above.



5-Shot Group, 100 Yards, Springfield Rifle, 18 Grs. DuPont Shotgun Powder, 170-Gr. Bullet

Through the columns of ARMS AND THE Man I would like to impart this information, and also discuss some things we still are unable to solve.

The first matter taken up will be on reduced loads for the Springfield, 1903.

After much trial, we found that the 18 grs. of DuPont No. 75 and the 150-gr. service bullet did not give the accuracy at 50, 100 and 200 yards that was wanted. Also we found DuPont No. 75 very expensive to load, as the powder cost us delivered here on an average of \$3.75 a lb. of 12 ozs. We also found that by careful test the 150-gr. bullet as sold by the Director of Civilian Marksmanship to N. R. A. users was very variable in both weight and diameter. Tests of samples of this bullet showed a variation of 2.5 grs. in weight and over .001 inch in size.

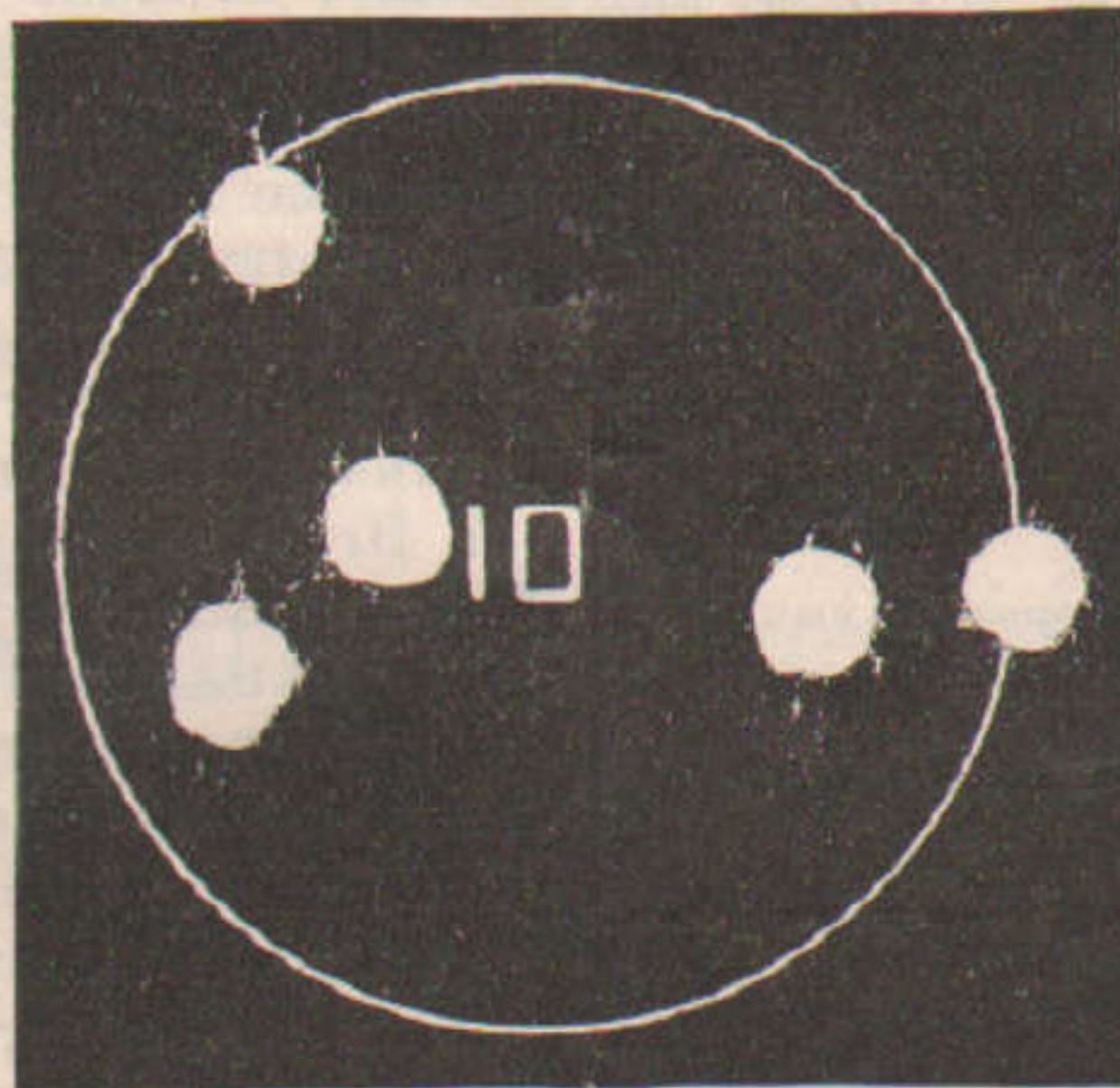
The first improvement we got in this load was using 170-gr. F. A. 1920 bullets. Repeated tests showed a 1.5-gr. weight varia-

tion and .0005 of an inch plus or minus diameter.

With the latter, load of 18 grs. DuPont and 170-gr. bullet we got ½ inch groups at 50 yards and many 1-inch and 1¼-inch groups at 100 yards against 1¼ inches and 2½ inches at same distances with the 150-gr. bullet. I have not as yet seen any mention in your columns of the 170-gr. bullet in short or reduced loads. It is, therefore, offered as an improvement for accuracy.

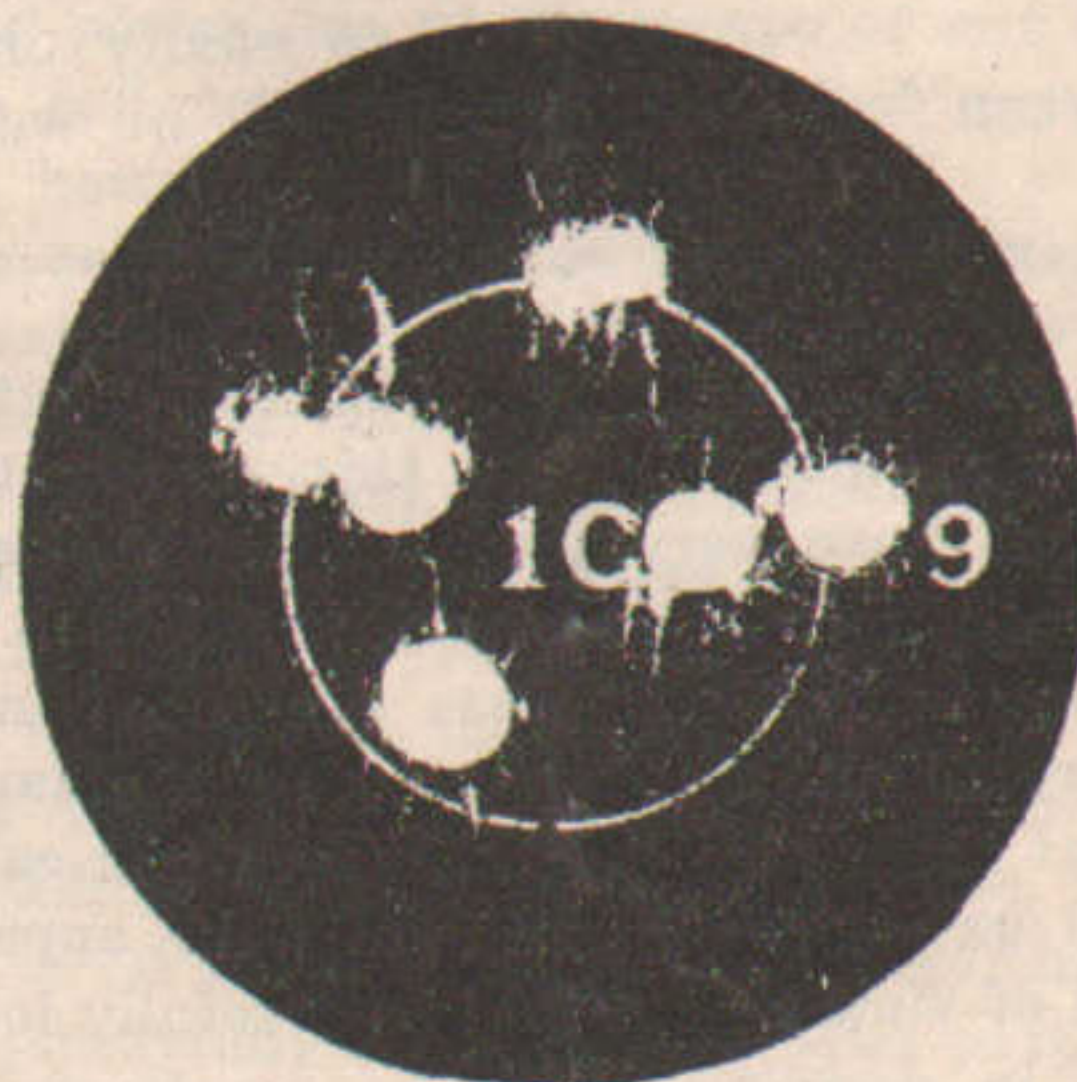
This solved one of the "X" troubles, as Dr. Mann was wont to call it.

The most valuable thing we discovered in



5-Shot Group, 100 Yards, Springfield Rifle, 15 Grs. DuPont Shotgun Powder, 170-Gr. Bullet

this test work was loading our shells for about one cent apiece with a powder that was very easy to get anywhere, very accurate, very clean, and only cost 60 cents a pound of 12 ounces. This powder is none other than DuPont shotgun smokeless, bought at nearly any gun store in the country. Once we saw it mentioned as a short load for Springfield, with a good deal of



6-Shot Group, 50 Yards, Springfield Rifle, 17½ Grs. DuPont Shotgun Powder, 170-Gr. Bullet

doubt attached. I want to say that, after 500 rounds fired with it, it is not only all right but superior in every respect to No. 75 or No. 80 as far as actual results go. It

is very cheap, very accurate up to a much greater range, about 400 yards on a still day, and burns clean with no greater recoil than No. 75 or No. 80.

I am enclosing some groups made with this powder and 170-gr. bullet which will speak for themselves.

At 100 yards this powder shoots about 1½ minutes higher than No. 75; at 200 yards it shoots six-inch groups easily. Fifteen grs. of it shot the same as No. 75 with 18 grs.

Most of the groups sent in were shot for group size only without reference to their location in the bull's-eye. In the case where groups were outside of the bull's-eye altogether the first shot hole was used as point of aim where the cross hairs were held.

The apparent trajectory of this load was about 5½ inches at 200 yards; that is, the load shot 5½ inches more elevation on the cross hairs at 200 than it did at 100 yards. It shot 25 inches lower at 200 yards than the full factory 170-gr. F. A. load with 50 grs. DuPont 17½ powder. Its point blank range was about 40 yards; that is, the line of sight and line of fire crossed at 40 yards. At 300 yards the load shot a minimum of 5 inches and a maximum of 9 inches on a very windy day, at least 20 miles of wind at 2 o'clock. The average of 5 groups was 7½ inches at 300 yards. It needed 9½ feet more elevation than 200 yards. At 500 yards on the same day, with a bad 2



5-Shot Group, 100 Yards, Springfield Rifle, 18 Grs. No. 75 DuPont Powder, 170-Gr. Bullet

o'clock wind, it shot a 22-inch group with considerable horizontal variation and an elevation of 19 feet more over 300 yards.

There is no doubt but that it will hold the bull's-eye at 500 yards on a quiet day.

The load is an exceedingly pleasant one to shoot at 200 yards offhand on the new 1921 National Match program.

Undoubtedly, the riflemen reading this will do so with some amusement and think that the powder companies would suggest this powder if it was all right. The writer has found the suggestions of the powder companies and some of their policies very perplexing.

Therefore, the above is offered to my fellow-rifle cranks for their careful consideration and test and open to all suggestions and criticisms.

The actual cost of above load for 320 shells: Powder, at 60 cents; 320 bullets, at \$2.40 (\$7.50 per 1,000); primers, 32 cents; total \$3.32. Fifteen grs. would load 384 shells at \$3.86.

ARMS AND THE MAN

1111 WOODWARD BUILDING, WASHINGTON, D. C.

SEMI-MONTHLY—ON THE 1st AND 15th DAY

Editor

BRIG.-GEN. FRED H. PHILLIPS, JR., Secretary N. R. A.

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Entered as second-class matter, April 1, 1908, at the post-office at Washington, D. C., under the Act of Congress of March 3, 1879.

That a man shall serve his country in time of war is noble, brave and patriotic; but that a man shall properly prepare himself in time of peace to serve in war is all of these things and more. It is noble with nobility which is real, not ideal. It is brave with a bravery which assumes in time of unemotional peace many burdens, among them that of bearing the lack of appreciation of those who do not consider military preparation or training necessary.

THE Editors of Arms and The Man will be pleased to receive constructive criticisms from readers. Do you like the paper? Tell us what features appeal to you. What will improve it? Give us your suggestions. The Editors want to publish a paper that will satisfy you. But remember that if a thing is not worth writing about it is not worth talking about. Write to us.

INTERNATIONAL MATCH AMMUNITION

A GLANCE at the results of this year's Bisley will emphasize the fact that the British rifle ranges have not yet been visited by a similar orgy of long runs to that in which our riflemen reveled during the Wakefield, Sea Girt and Camp Perry Matches.

While a possible score, even under fairly difficult shooting conditions, could be regarded only as the basis of a long run in the big individual long range matches here, and the winning of an event involved not only a trial of skill, but one of protracted endurance, at Bisley the Whitehead Memorial, fired up to 1,100 yards, was taken on a score of 96x100; the Edge, on a score of 144x150; the Halford Memorial, on 132x150, and the Albert, at 900, 1,000 and 1,100 yards, on a total of 205x225.

Admitting that the British system of "carton" shooting

presents greater difficulties to the aspirant for marksmanship honors than does our own, where the entire black gives the highest count, this cannot in any way be regarded as the sole reason for the great difference between Bisley's winning scores and those recorded at our meetings.

It is proper and fitting at this time to admit that if we are faced with the problem of redesigning our long range targets in order to save target shooting from the curse of deadly monotony, our predicament is directly traceable to the high standard of skill attained by our ammunition-makers in producing the most accurate fixed ammunition that the ballistic world has ever seen. The production of special ball cartridges of the high accuracy of this year's winning Palma-Olympic and the service ball cartridges, is as revolutionary a step in the ballistic world, as, for comparison, the invention of percussion ignition. Giving to the 1921 Springfield full credit as the peer of military arms, and to the skill of the hard holders who won the matches unstinted praise, the fact remains that the best of rifles cannot be made to perform with cartridges of inconsistent qualities.

Great Britain has no such institution as our annual ammunition tests which precede our participation in National and International Matches. Unquestionably that is one of the principal reasons why the British Service ammunition cannot approximate the accuracy shown by this year's Frankford Arsenal product and that the de luxe cartridges of British loading company manufacture fail utterly to group with our Palma-Olympic type ammunition.

With this in mind, American riflemen cannot fail to recognize the important part which this year's winning ammunition has played in making our rifle matches exhibitions of the highest degree of accuracy and precision, instead of being simple competitive meetings, where the high score—no matter what the total is—wins the event. With an ammunition of this high standard, rifles must be made which will adequately and accurately control it; shooters must be developed who can bring out the ultimate results to be expected after machine rest tests; targets must be designed and match conditions must be devised to make the game harder—and more interesting.

Our ammunition-makers are undoubtedly preparing to enter in the 1922 tests match cartridges for the purpose of surpassing even the excellence of this year's product, and any which makes a better showing than the winner of last year's test will, indeed, be a wonderful load. Also, with equal certainty steps will be taken to make the ultra-long run of less frequent occurrence, since interest in the sport of marksmanship must wane when the maximum score is so easily obtained. The results of both of these activities will be well worth observing.

WAR FIELD GLASSES

(Continued from page 6)

In one case it rises to the enormous field of 70 degrees. There is a third type of field glass with an intermediate apparent field of view, in which the image is erected by means of a so-called terrestrial eyepiece, which is several inches long. This type is seldom found as a binocular; it is usually made as a draw telescope. It has an apparent field of about 30 degrees.

The size of the apparent field can not be guessed by looking at the outer shape of a prism glass or a draw telescope. It is not decreased by reducing the size of the object glasses, but in the Galilean type

the size of the object glass does affect the apparent field and for this reason these glasses have very large object glasses in proportion to their low magnification. In buying a Galilean glass one need never worry about the brilliancy of the image; all of them give bright images and can be used as night glasses. It is the apparent field of view that should be carefully looked into in deciding upon the purchase of a Galilean glass. On the other hand, one need not be concerned about the field of a prism glass, but only about the brilliancy of the image. The lenses must be made small because otherwise the erecting system of prisms will be too large and too heavy.

Now the size of the exit-pencil becomes important, because it determines the brilliancy. It may permit the use of the glasses at night, or only by day in good light.

The exit-pencil is a condensed cylinder of light issuing from the eyepiece. It can be seen by holding the glass a few inches before the eye and looking through it. I shall use millimeters in discussing this exit-pencil, of which 25.4 equal one inch. When the light from a fixed star enters the naked eye, it passes through the opening called the eye pupil in a cylinder 7 mm. in diameter. If we use a field glass, a cylinder of light the size of the object glass is con-

densed and passes into the eye. The star appears more brilliant seen through the field glass. If the object glass is 49 millimeters, its diameter is about seven times larger than the eye pupil, and its area is 49 times as large. We shall get 49 times as much light from that star. But if we look at the moon, which has an image of finite size, we get, to be sure, the 49 times more light from the moon, but this light has to be spread over an enlarged image of the moon. If the glass magnifies seven times the image will be 49 times as large as when seen with the naked eye and will be as brilliant. We can not see it more brilliant by reducing the magnification, because then the exit-pencil will be larger than the eye pupil and not all of the light that enters the object glass will enter the eye. If the glass magnifies, for instance, four times, the exit pupil will be 12 millimeters. All but seven will hit outside of the pupil. Actually the image seen through a glass is never as brilliant as with the naked eye except in looking at the fixed stars, which form an image so small that it is not magnified. We get the effect of a greater brilliancy in using a night glass because the magnification enlarges the details, which we distinguish more clearly. A good night glass has an exit-pencil of about 7 mm. If it is smaller, as it will be if the glass with a 49-mm. object glass magnifies 12 times, then the image will be dull, because the 49 times more light is spread over a surface 144 times as large as that seen with the naked eye.

By day, in good bright sunlight, the pupil of the eye is smaller. It may be only three to four millimeters. Therefore a glass with an exit-pencil less than 7 mm. will give as bright an image as possible. The glass will have smaller lenses and prism, be cheaper and lighter and more compact. For six powers its object glass may be only 20 mm., the exit-pencil being only 3.3 mm. If the object glass is 30 mm., then the exit pupil is 5, and the glass will show a brighter image at dusk when the pupil of the eye is dilated. In draw telescopes the exit pupil is usually much smaller, sometimes as small as 1.5 mm. Such a glass, with an object glass of 42 mm., may magnify 28 times. It will give dull images even in the best of light. In observing the fixed stars the exit-pencil is sometimes reduced to 0.5 mm. The star nevertheless appears almost as brilliant as with a smaller magnification and the distance between two close stars is enlarged.

In deciding upon the purchase of a prism glass one should note the size of the exit-pencil, obtained by dividing the diameter of the object glass by the magnification. This and the magnification itself are all that need be considered since the field of view will be large enough.

The draw telescope is a useful glass for the hunter, because it costs less than a

binocular prism glass and weighs less. One should not be deceived by its very long form into thinking that the apparent field is very small, for it is larger than that of the shorter Galilean field glass. Usually the draw telescope magnifies too much for the size of the object glass. When there is a choice of powers, it is better to choose an exit-pencil not less than 2.5 mm. For instance, if the object glass is 1 $\frac{5}{8}$ inches, which is 42 mm., the magnification should be about 15. A one-inch draw telescope magnifying from 7 to 10 is a very handy glass to carry in the pocket where weight counts. The length of a draw telescope can be reduced by making the lenses shorter in focus. The magnification is the quotient of the focal length of the object glass, divided by that of the eyepiece. Two draw telescopes may have the same magnification and the same exit-pencil, and yet one may be much shorter than the other. The object glass will have a larger relative opening in the shorter glass, because its

diameter is the same as the other and its focal length is less. This requires a better achromatic correction and therefore the best of these shorter telescopes have object glasses of three lenses cemented together instead of the usual two. Made by the best makers, they are very attractive instruments, both as single tubes with one draw only, and as small binoculars, weighing half a pound and so compact that they can be carried in a cigar case. The apparent field of view varies considerably, but is on the average about 30 degrees, against 15 degrees for a Galilean glass and 40 to 50 for a prism glass.

There is a special type of Galilean glass that is also better corrected than the usual type and has lenses of shorter focus. It is called the eight-lens system, and its advantage is in its smaller bulk, both shorter and with object glasses smaller in diameter. The smaller object glass does not reduce the brilliancy because the exit-pupil is large enough.

Relative Power of .22 Rifles and Pistols

BY VAN ALLEN LYMAN

AFTER a delay of several months the writer found time and opportunity to satisfy his curiosity on a point about which he had never been certain and on which he had never seen any definite data, *i. e.*, the relative power of the .22 long rifle cartridge when fired from a rifle, a single-shot pistol, an automatic pistol, and a revolver. It was naturally expected that the rifle would show the most power, that the single-shot pistol would be next, for it is essentially a short-barrelled rifle; that the automatic pistol would be a close second to the single-shot, but less powerful, owing to its somewhat shorter barrel, and that the revolver would come in at the end of the list because of loss of power due to the escape of gas between cylinder and barrel. Actual experiment, however, proved differently.

The test was made on the basis that a .22 long rifle cartridge fired from a rifle represents the maximum efficiency of this cartridge, which may be called 100 per cent. Cartridges fired from arms of the pistol class will more or less approach this maximum, but owing to their shorter barrels the pistols can obviously never equal it. The proposition then is this: While a rifle, because of its longer barrel, will always shoot more powerfully than a pistol, what part of the rifle's power will the pistol develop, using the same cartridge?

Four arms which can be considered representative were used in this test, all practically new and in perfect condition in every respect, just as they left the factory and never tampered with. They were, a Remington U. M. C. No. 12 repeating rifle with

22-inch barrel; a Smith & Wesson single-shot pistol with 10-inch barrel; a Colt automatic pistol with 6 $\frac{1}{2}$ -inch barrel, and a Smith & Wesson heavy-frame revolver with 6-inch barrel. The cartridges used were Rem. U. M. C. Lesmok with the standard solid round-nosed bullet and all were taken from the same box. The test was made by firing into a piece of clear, sound, well-seasoned spruce at a distance of six feet from the muzzle of the arm. Twelve shots were fired from each arm. The wood was sawed apart along the line of each bullet hole and an effort was made to get the fair average for each arm by taking, out of each group of twelve shots, the five which seemed the most representative. As certain of the bullets turned in the wood, went off the straight course, or mutilated themselves somewhat such were among the discarded. To insure accuracy so far as possible penetration was measured from the planed edge of the wood to the point of the bullet with a pair of draughtsman's dividers.

The rifle was, of course, in the lead, but the single-shot pistol with the 10-inch barrel was a very close second, the difference in penetration being only 2 per cent. To all practical intents and purposes, therefore, the single-shot pistol with long barrel has as much wallop as the .22 rifle.

The surprise came in the matter of the .22 automatic against the .22 revolver. After long taking it for granted that, with the same cartridge, the automatic would necessarily shoot harder than the revolver because of the gas escape between the cylinder and barrel of the revolver it was a

rather staggering surprise to find that the automatic, which the writer had made such a pet of, actually shot with LESS penetration than the revolver. The total penetration of five shots, added together, was for the revolver 270 millimeters (about 10 11-16") and for the automatic 227 millimeters (about 8 5-16"). All of which shows that it is not well to take things for granted and that a little original experiment is a good thing occasionally, for we learn thereby.

This naturally brings up the question as to whether an automatic would not eventually outshoot a revolver (mind I speak of .22 caliber) after the revolver became worn and shaky from much use. High-grade .22 revolvers after they have endured much hard service are sometimes pretty shaky as to cylinder locking and show a generous opening between barrel and cylinder, though it takes much, much shooting to put a first-class revolver in this condition and the best of them will stand up to an immense amount of grief. An automatic with an equal amount of service would presumably be in better shape, for there appear to be no points about an automatic where wear of the mechanism could affect the accuracy or power.

But the experiment was made with new arms under conditions as fair to each as possible and showed results in penetration as follows: Rifle 100 per cent, single-shot pistol 98 per cent, revolver 93¼ per cent, and automatic 78½ per cent. Approximating it roughly we may say that the rifle and single-shot pistol shoot equally hard, that the revolver shoots with 9-10 the power of the rifle and that the automatic shoots with 8-10 the power of the rifle. This is near enough and easy to remember.

The criticism may be made that five shots per arm is insufficient to give a fair average. To this the writer would say that if any one else cares to make the same experiment with more shots and perhaps several arms of each class in an attempt to get a closer average the writer would be glad to have him do it and report the result. In the recorded test nearly fifty shots were fired and the wood carefully and laboriously cut apart at every shot hole with a hand saw. Out of all the holes cut open the five which seemed most fairly representative for each arm were taken. The entire business took the best part of a day and was a thankless job, though it developed enlightening information. The writer doesn't propose to do it again, but if some one with the time to spare and the arms available would repeat the experiment on a larger scale and in a careful and unprejudiced way it would form a valuable check on the results already obtained.

As a matter of fact the tests simply indicate relative power and by no means prove that one arm is superior to another. They are all .22's anyway and when one men-

tions power of a .22 pistol or revolver he is speaking of decidedly limited power at best, compared to what other cartridges can do. The automatic has slightly less penetration than the others but it is certainly their superior for rapid shooting. The revolver is somewhat betwixt and between, a little slower to shoot but has a little more power. It holds all the shots one is likely to need and in addition it can be used with "shorts" for snap-shooting practice. The single-shot pistol is the most reliable and the most powerful and accurate of any, practically never gets out of order and will handle any .22 ammunition that can be put into it, including extra longs. But it is a

one-shot gun, therefore the shooter must be very careful to make his one shot count, if game shooting.

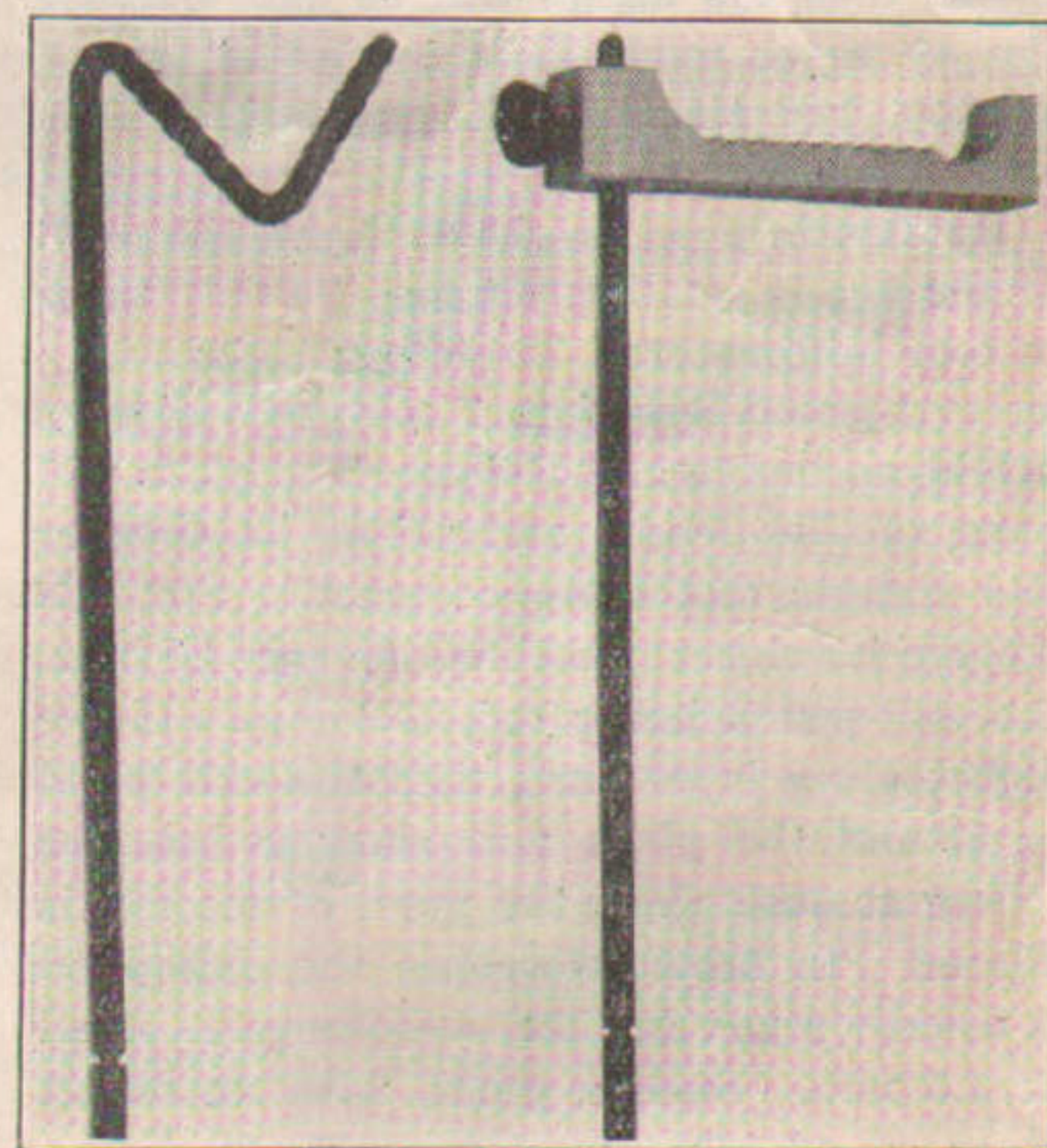
Everything considered it seems about a toss up between the automatic, the revolver or the single shot. We have many of each at the club of which the writer is Executive Officer, one of the largest of the United States Revolver Association clubs, and the individual members each swear by the merits of their particular pet arm. They are all good. They all make high scores and all will kill small game if handled right. Constant and careful practice by the man behind them is what brings out their full possibilities.

Odds and Ends for the Rifleman

By MAJOR TOWNSEND WHELEN

THERE is scarcely a piece of equipment for the rifleman on which more thought and ingenuity has been displayed with less results than on telescope holders. They are designed to hold the high-power telescope, used for spotting and wind doping, just to the right of the shooter's rifle as he aims in the prone position. All the shooter has to do to see his target is to lean a little to the right until his eye comes into the field of the scope. The essentials of this article of equipment are that it shall hold the scope absolutely steady, even in a pretty strong wind, that it shall be quickly set up and permit the scope to be quickly and accurately trained on the target, that it shall be small and light enough to go in the dope bag, and, lastly, there is no reason why it should be expensive. Now, there is not a single telescope holder on the market that does not seriously violate one or all of these requirements. Almost all of them are hard to set up in alignment with the target, requiring all the rifleman's attention just as he is about to start shooting, and often within his time limit. They don't stay in adjustment any length of time, some perching precariously on blades of grass, and others depending upon little light pin points stuck into the ground. The scope vibrates in them most exasperatingly. They are often so bulky you can't get them in the shooting bag unless you have one made specially for them. Up until the present time perhaps the most satisfactory and cheapest scope holder has been simply a pair of steel rods, about 16 inches long, with a U shaped at the top. These are stuck in the ground securely and the scope rested in the bent portion at the top. They hold the scope securely, and it does not get out of alignment. There are two objections to them, however. They will not fit in any dope bag. They are very hard to align quickly on the target. You stick the front

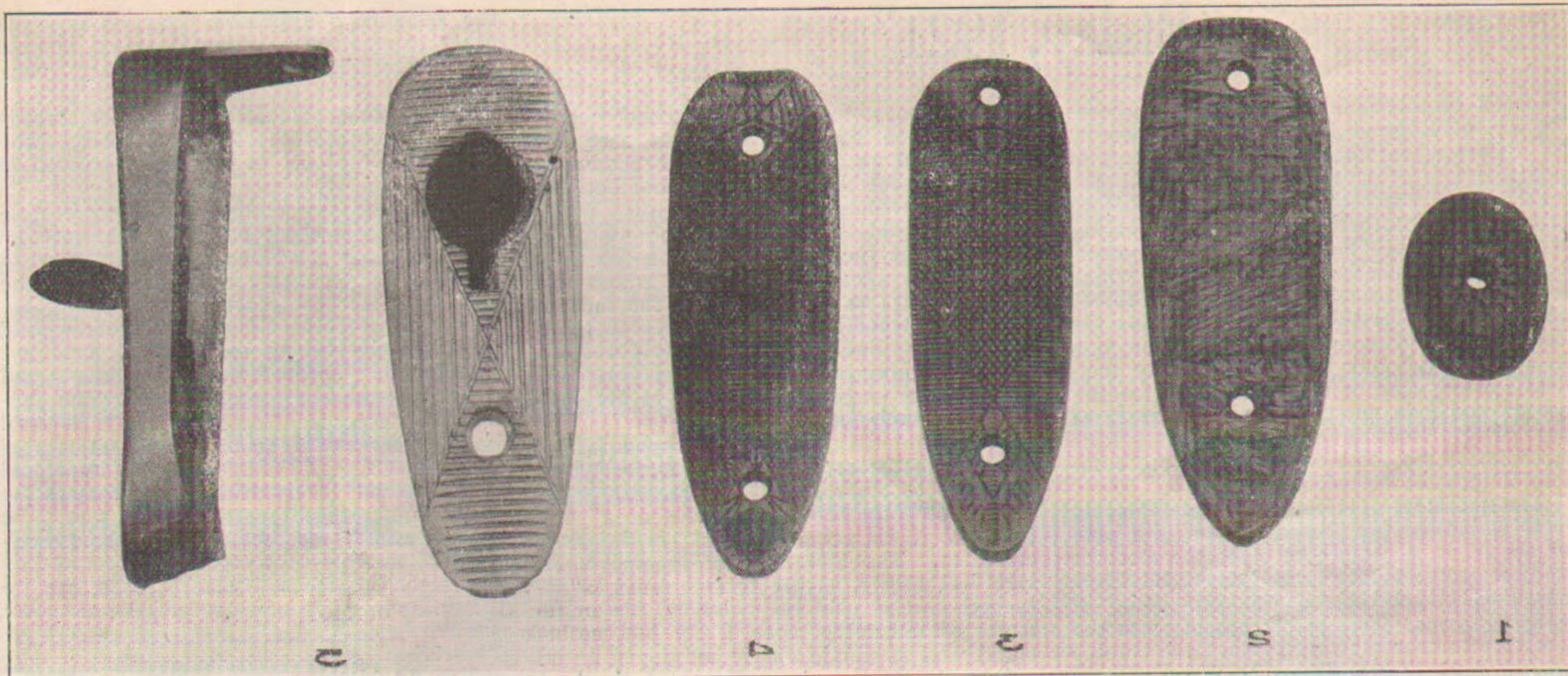
one about 6 inches down in the sod, then put the scope in it, extended to the rear. Then you get down and line the scope up with the target, and try to stick the rear rod in the ground so that the scope will come into line with your target. Most of the time you don't get it exact, and then you bend the rear rod to the right or left, which makes it loose in the ground; or you



The Whelen 'Scope Stand

get it stuck too far in the ground and have to pull it up, which makes it loose again, and when it gets loose it vibrates and does not stay on the target. Just one more darn thing to annoy you when you are shooting.

At the national matches this year I used a scope holder which several of us got up, and it not only proved most ideal, but it attracted a lot of attention, and many requests for ones like it. My name has since been coupled with it very much in the same way that Captain Crossman succeeded in pinning the tin can ammunition to me, but



Aluminum Butt Plate, Left and Special Engraved Butt Plates and Pistol Grip Cap

I have no interest in it except my desire to pass something that I think good on to the fraternity. In this holder we have taken advantage of the fact that the two steel rods make the best and most secure rest for the scope when they are placed in correct alignment and securely stuck in the ground, and we think we have succeeded in eliminating all the objectionable features of such rods. First, the rods are jointed like a jointed cleaning rod, so they unscrew to 10 inches and go nicely in the dope bag. The steel is hard and there is no wear or looseness in the joints. The front rod simply has a V at the top in which any scope will lie securely. The rear rod carries an adjustable aluminum arm bearing a number of teeth on its upper surface. Now for its application. Force the front rod into the ground securely so that the V is about 10 inches above board. Stoop down and again force the rear rod into somewhere near the line formed by the front rod and the target. You don't have to be particularly accurate; within an inch or two of the line will do. Put the scope in the front V and on top of the aluminum arm on the rear rod. Lie down and look through the scope. Raise or lower the aluminum arm until the scope is on the line of targets. Slide the scope sideways along the teeth until you come to your target, and there you are. Your strong steel rods are six inches in the ground, and there is nothing to shake. And the whole blooming thing, as it has been made up with good workmanship, costs less than half what all the other scope rests on the market set you back.

Also this holder is particularly applicable to small-bore shooting. Usually the small-bore rifleman sets up two or more targets in the rack alongside of each other. He

sights in on the end one, and then turns on each of the others in turn to shoot his record scores, and often he has to alter his scope holder each time, and you know what this means—more darn bother and annoyance when you are shooting. With the Whelen holder just shove her along one more notch on the aluminum arm, and there you are again.

In the Dewar Trophy Match I was coaching Emerson, and he had just finished shooting. Stokes was four or five firing points down the line, and we wanted to know how he was doing. I simply swung the arm around on the opposite side of the rear rod, ran the scope along a notch or so, and it came right on to Stokes' target, and we at once saw an excellent example of the kind of coaching Frank Kahrs told us about in a recent number of our paper, for Kahrs himself was by Stokes' elbow. The accompanying photograph shows and describes this holder very fully.

Also let me call your attention to the second photograph. More rifles are being remodeled every day. Fine gunsmiths are springing up all over the country who can do this kind of work in excellent shape. Rifleman are getting to realize what it means to have a stock which fits them exactly, and these gunsmiths are experts at fitting and making fine stocks. Almost all of them are only stockers, and formerly they got all their various metal parts such as butt-plates, pistol grip caps, sling swivels, and barrel bands from Germany. That market is now practically closed, and for several years it has been practically impossible to get any of these articles that are worth two cents in this country. Now, however, one firm has been formed that makes a specialty of making these accessories to order just as you want them.

Mr. Howe is a first-class toolmaker, and master machinist. Mr. Kessler is a skilled and artist engraver, and together they make an ideal team. They have a few standard articles that they can ship on order, but really their specialty is making things just as the rifleman wants them. In other words, you can now display your own individuality on your pet rifle, designing all the accessories, having them plain, checked, shaped, and engraved just exactly as you wish. The illustration shows an aluminum butt-plate for the Springfield which screws on in place of the regulation plate with the same screws, and lengthens the stock five-eighths of an inch, thus making it just about the right length for the average rifleman—that is, 13 $\frac{3}{8}$ inches. The checked steel butt-plates are full man size, and are checked so sharply that they will not slip. Notice that the checking is artistic, and that at the same time it is so designed that it stops both an up and down and a sideways slip. There is also shown an elaborately engraved butt-plate carrying out a customer's ideas, and a steel pistol grip cap. They are now working on a bronze pistol grip cap in the shape of a bear's head which should be most appropriate. Also on a combined military and Schuetzen butt-plate for free rifles, which can be changed from one to another quickly and readily.

CLUB USES SQUIRREL TARGETS

THE Akron, Ohio, rifle club has introduced a rapid-fire match at targets representing gray squirrel. The targets are divided so that head or heart shots count 5 and neck and chest shots count 4. Other hits are scored as misses on the theory that the game would be lost on such hits.

The targets were designed by Dr. Malcolm D. Miller at the suggestion of Maj. Townsend Whelen.

"Bisley, 1921"

SOME impressions of this year's successful meeting at Bisley are set down by "Carton" in *The Rifleman*. He says in part:

It seems somewhat odd to be writing about the Empire's Great Rifle Meeting which took place last month. Most of us have waded knee-deep in its figures which have appeared in cold type in the "dailies" as much as a matter of record as for the sake of imparting information to "the man in the street," but there were many incidents overlooked in the search for leading scores and I do not think that the story of the Bisley Meeting of the National Rifle Association for 1921 would be complete unless they were recorded.

The passage of time does not seem to have smoothed the obstacles from the path of the N. R. A., and ever since the element of "service" shooting was introduced there has been more than a few pin-pricks of various forms. This year's anxiety was the dearth of markers owing to the Irish trouble which kept the Military Departments on their toes, so to speak, but the Navy came to the rescue and all went well. 'Tis not the first occasion the blue-jacket has stepped into the breach. At recent meetings leakages have been reported on the account for practice tickets at the conclusion of the shooting. This year these tickets were issued in the same way that egg-pool tickets were in former years, with the additional precaution that on use every ticket must be torn in half, the register keeper retaining one portion and the competitor the other; and in order to stimulate the interest of both parties in this part of the regulations, each ticket was numbered.

At the end of the meeting forty prizes of £1 were awarded by lot to different numbers and the holders of these numbers, both competitors and register keepers, received a prize. There was devised an entirely new system for squadding all competitors in shoulder-to-shoulder events. Each entrant was given a number which was used in conjunction with a printed table. The hundreds in the number were read off from the first column on the table and gave the actual time at which the competitor was squadded. The tens were dealt with in the second column which told the number of the range, and the index figures gave the actual number of the target in a third column. Thus every competitor was asked to squad himself from the number he found on his card. This system saved the staff considerable work, not only in actual squadding, but also in the time necessary for compilation, with the result that entries were not closed down so early as in former years. The new system had a further advantage of being somewhat more elastic in the event of post entries received and was, when understood, considered decidedly simple.

On Thursday, when the meeting opened, it was indeed unusual to observe the schoolboys launch the attack on the Century range instead of—as we were accustomed to notice in former years—the veterans with their telescopic-sighted match rifles, the latter, by the way, having a day of "unlimiteds" over Stickle-down. I understand that for practically fifty years the match rifle has declared the great meeting open, so we are given to surmise that greater encouragement and additional facilities are to be offered the Public School boy. Anyhow, I take it that it augurs well for the future. The shoot of the opening day was the "Yale and Polden" and was viewed as

a preliminary to the "Ashburton" which was fired on Friday. The lads used the service rifle as issued. In many competitions this year the short magazine Lee-Enfield rifle without any extraneous device was employed, but it should be noted in passing that the wind gauges on the open sights were allowed to be used, which was sound policy, as it encouraged the lads to study the wind in a more earnest manner than if they had to aim off the figures, although aiming off on the new "tin hat" target is an easier matter than in the days of the much-despised "bull's-eye." The cadets adopted this class of weapon for all their competitions, and there was no lack of keenness to make a good score. However, I can not class the "use of the sling" and the "use of the orthoptic sight" in the same category. The latter is an expensive device, but surely, as the former must be attached to the rifle by order of the exponents of musketry, then I can not understand why it should not be employed as an aid to steady the aim and so get the best out of the rifle "as issued" if one can, or cares, to do so. This is a question which has entirely failed to get any sort of a satisfactory answer. The sling is used at Bisley and by all who shoot with a rifle in an intelligent and scientific manner, and it should certainly be allowed in the schoolboy events because it would give an additional interest and teach them how to get the best out of their weapons.

Talking about the various types of rifles used in full-charge shooting, I gleaned that the popular vote was accorded the service rifle "b," which is practically the British rifle of the war with an orthoptic sight adjusted and also a sling attached—one of the kind which may be used for steadying the aim. I mention that this class of weapon was the most popular, but I do not think was considered to be the most accurate target weapon, although it behaved very well indeed in the last stage of the "King's." Most of the old stagers would prefer the S. M. L. E. "b" to the S. M. L. E. "a," for the simple reason that their eyesight is not any too keen at their particular age, so it was certainly a step in the right direction when the aperture sight was allowed to be used in the "King's" and many other service rifle events. With the schoolboys matters are different, because the lads are at an age when their eyes have the greatest power of adaptability, while we have also to consider the fact that they belong to the junior division, Officers' Training Corps, and as they will probably provide many of the officers of the future, it is important that they should be encouraged to take shooting seriously. Before the war civilians simply adopted rifle shooting as a pastime, and shooting under conditions approximating to battle practice—rapids and snap-shooting—had very little attraction for them. Schoolboys are being trained to the view that in order to develop the value of the weapon to the fullest extent, it is necessary to be a marksman of a practical type; that if we possess the best weapon we should not neutralize its value by not adopting the best method of training. However, we can never approach to service conditions in peace-day shooting, for the marksman is placed in certain attitudes from which he may not depart and he invariably fires at fixed targets that do not resemble anything like a battle target. There are many events at Bisley though which are supposed to resemble service conditions, and

the schoolboys approach them as near as other competitors, although they do not reach the limit—the "Queen Mary" competition.

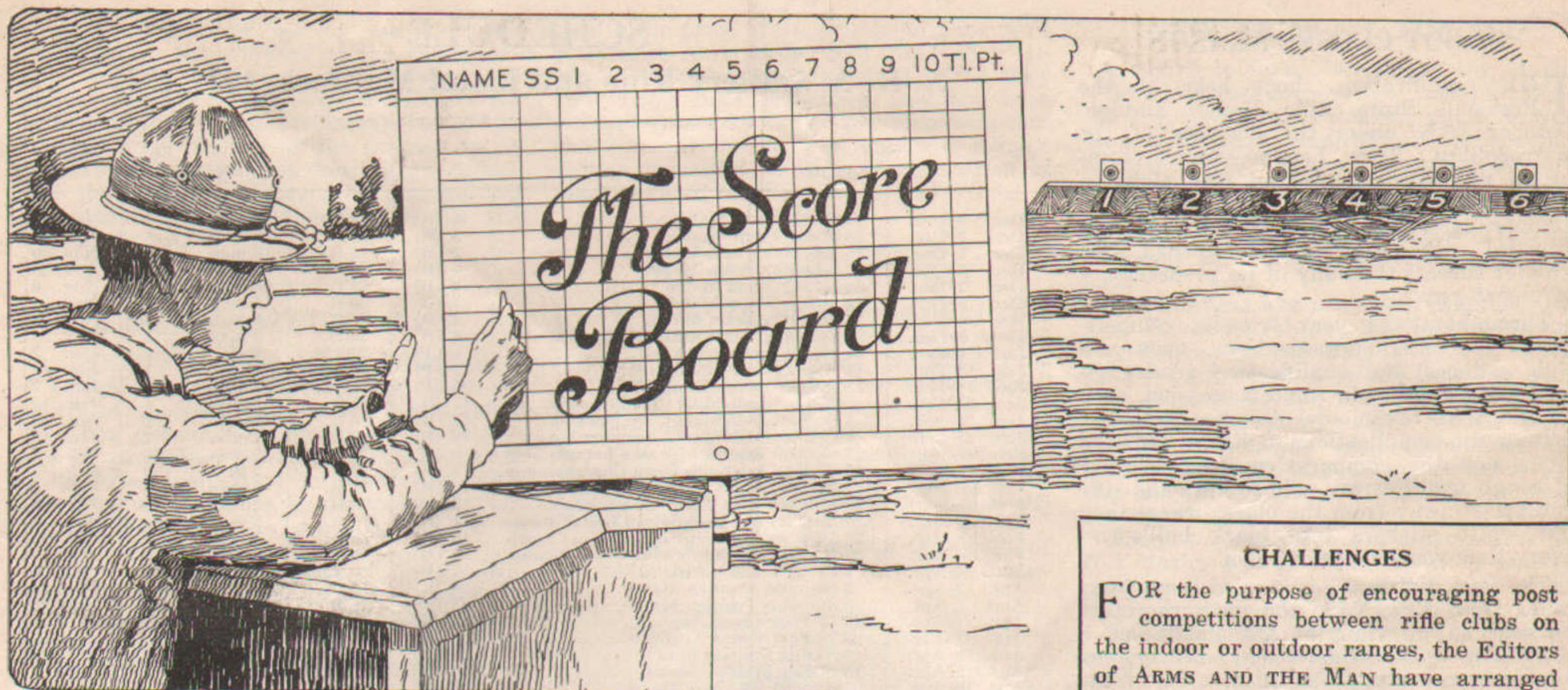
I sometimes think we use the words "service conditions" a little too freely. One has not to be long on the Bisley ranges to observe that musketry training, with its rough and ready methods of war, is conspicuous by its absence. If we acknowledge that the cadet should be trained in peace to see and do as nearly as possible what he would see and do in war, his shooting, besides taking place at moving targets, should be at unascertained ranges. If it is not possible to introduce the unsteadiness and difficulties generally experienced when facing an enemy, the best training, if it could be secured, would be to fire at objects of different sizes and shapes and at undefined distances and in situations calling upon the marksman's intelligence. That would be service conditions, but it would be practically impossible to fire competitions of this character at Bisley, where there are so many landmarks known to all riflemen. We should have to send the lads to Ash or Pirbright.

The "Ashburton" seems to be gaining popularity each year the competition is fired. In its early days only three teams entered: these were from Eton, Harrow and Rugby, but at this year's meeting no fewer than fifty schools were represented. It may surprise some ex-Service men who picked up a rifle during their war training for the first time, and who talk extravagantly about recoil, shock and kick of the S. M. L. E., that the Public Schools send to the meeting their younger shots, for each lad must be under twenty years to be eligible to compete, the average age being eighteen. Some of the lads did not appear to be much taller than their weapons, but we were pleased to admire the business manner in which they settled down to business, nor did we fail to observe the enthusiasm of the Yorkshiremen when they heard that Sedbergh had repeated their victory of 1914. We can not place too much importance upon the "Ashburton," for the competitors are the young guard of Bisley. The old guard of Bisley, as we knew them in the old Volunteer and Territorial day, is fast dying out. It will be years before the new Territorial Force will outnumber the regular forces as regards competitors, and Bisley may be even more a Naval and Military meeting in the future than it was last month. But from this young guard we may expect to provide the expert match rifle shot, the man who can devote his time and money towards the science of rifle shooting.

One could not help thinking when observing the preparations made for the meeting, what a good idea it would be for the N. R. A. to raise the status of "Bisley" to that of an olympiad, that is, a great rifle championship meeting both in relation to the nation and the empire. I gather that there is something afoot that the Army championship meeting, the territorial championship meeting and the rifle club championship should be fired on the Bisley ranges and that finally there should be a contest to decide the Empire champion rifle shot. We understand that everything is ready for an all-embracing scheme of this kind, but that the council of the N. R. A. are anxious to ensure success by reducing by some means the present high cost of rifle shooting to the civilian competitor, this being one of the principal parts of the scheme which, at the moment, impedes progress.

It was indeed a clear indication that service rifle shooting will come into its own once

(Continued on page 16)



Russian Rifles Available

By COL. C. E. STODTER

DURING the recent war a large number of rifles were manufactured in the United States for the Russian Government, but owing to the revolution and subsequent events in Russia some of these rifles were not delivered.

These rifles, together with ammunition for same, are now available for sale to members of the N. R. A. at \$10.00 for the

are loaded by means of a clip. The cartridges are forced upward by a follower which is hinged to a swinging carrier.

There is no magazine cut off, but as the follower does not lock the bolt open when the magazine is empty the rifle may be readily used as a single loader.

The rear sight consists of a fixed base and a hinged leaf which is elevated by



The Russian 3-Line Rifle

rifle and \$8.00 per thousand for the ammunition.

An opportunity is thus afforded of securing a modern high-powered rifle at a very low price and one which costs very little to shoot.

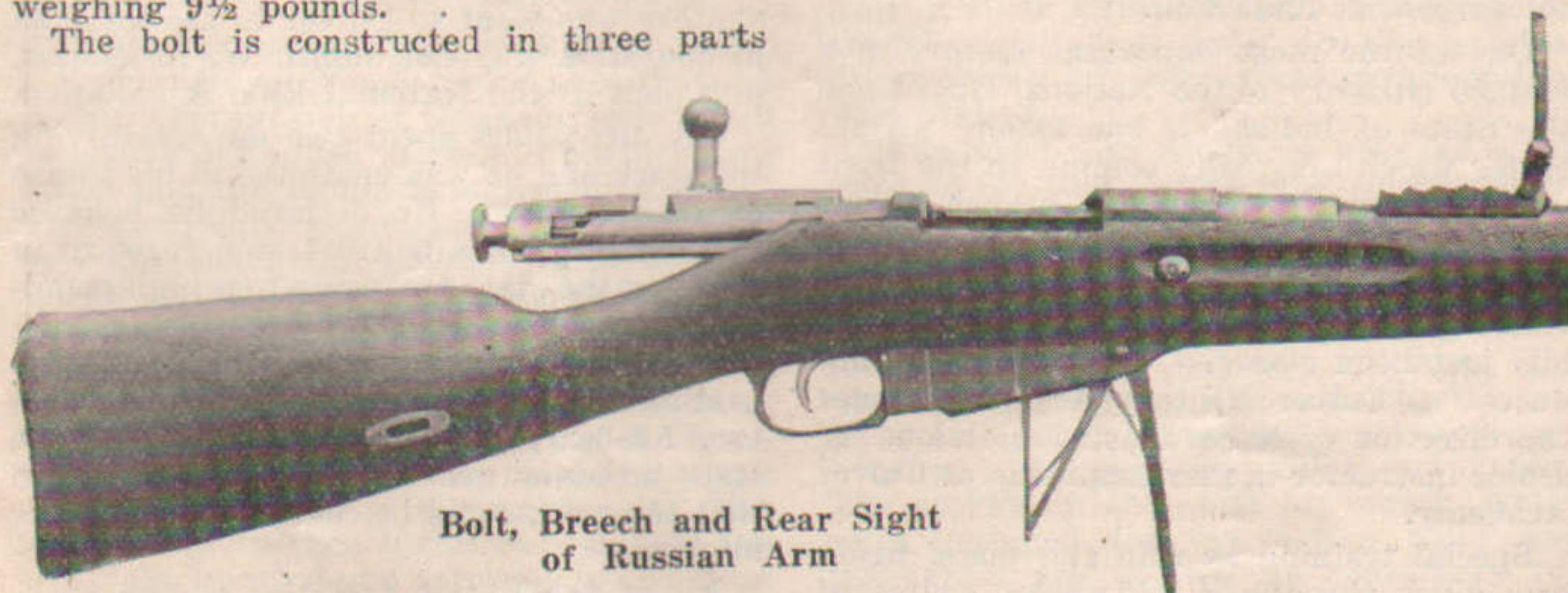
This is a 7.62 mm. (.30 cal.) bolt action magazine rifle with 31½-inch barrel and weighing 9½ pounds.

The bolt is constructed in three parts

means of a slide that engages in series of steps cut in the upper part of the base. The sight is graduated in paces and may be adjusted from 400 to 3,200 paces. There is no windgauge.

The rifle has a well-shaped stock and a butt plate that fits the shoulder. It is longer from the trigger to butt plate than our Springfield, which makes it more comfortable to shoot.

This arm is rifled with a uniform twist of one turn in 9.45 inches. There are four



Bolt, Breech and Rear Sight of Russian Arm

which can be readily separated for cleaning. The opening motion of the bolt partly cocks the firing pin and the closing motion completes the cocking.

The rifle may be cocked by raising and lowering the bolt handle or by drawing back the cocking piece.

The magazine holds five cartridges which

grooves which are twice the width of the lands.

The cartridge for this rifle has a rather short, thick case, larger in diameter than the Krag or the Springfield and loaded with a 147-grain bullet of nearly the same shape as our 150-grain 1906 bullet. This cartridge gives a velocity of 2,900 f. s.

CHALLENGES

FOR the purpose of encouraging post competitions between rifle clubs on the indoor or outdoor ranges, the Editors of ARMS AND THE MAN have arranged to set aside space every week for the publication of challenges.

Clubs wishing to take advantage of this column should address letters to the Editor stating the conditions under which they would like to compete and the dates between which the match could be staged.

There has been considerable interest recently in inter-club shooting. The most important event which is being arranged is a proposed match between the Georgetown University Rifle Club and either Cambridge or Oxford Universities. This will of course be an international cable match. The Secretary of the British Society of Miniature Rifle Clubs has been asked to assist in having such a match scheduled.

A post match has been arranged between the Pasadena, Calif., Rifle Club and the National Capital Rifle Club of Washington, D. C. Teams will consist of 10 men, 8 high scores to count, 20 shots per man on the standard N. R. A. target at 100 yards.

There are about 125,000 rounds of this ammunition on hand at Columbus, Ohio, and 4,000,000 at Benicia Arsenal, California.

This rifle can be readily converted into an attractive sporting model, but it is not practicable to rechamber it for other .30 caliber cartridges.

The bullet for the Russian Rifle is of the same diameter as the .30 Springfield and the .30 Krag. This permits the use of either of these bullets in this arm. Reloading empty Russian shells is entirely practicable. The primer pocket is fitted with the American type of centered flash hole.

Orders for rifles and ammunition should be sent to the Director of Civilian Marksmanship, War Department, Washington, D. C., accompanied by bank draft, certified check, or money order for the correct amount.

Separate remittances should be made for rifles and for ammunition as the rifles are at Rock Island Arsenal, Illinois.

SHOOT CLOSES SEASON

THE qualification shoot held at the Peekskill State Rifle Range Sunday, October 16th, under the auspices of the Metropolitan Rifle League—which comprises military and civilian rifle clubs in and about Greater New York—closed an outdoor shooting season that has been crowded with activities and crowned with greater success than any of its predecessors of recent years.

Throughout the year friendly competitions with other organizations, open and club matches and qualification trials followed one another in rapid succession, each an eloquent testimonial to the fact that neither the complications of life in crowded cities nor the comparative inaccessibility of range facilities are able to keep the rifle enthusiast away from the places where they put white stickers into black bull's-eyes every time you hit one of them.

The Peekskill range is located some forty miles from New York and must therefore be reached by train or automobile—as a rule. The season's final shoot, however, was a much more stylish affair in view of the fact that it was preceded and followed by a Hudson River excursion on a vessel of the 2d Naval Battalion, whose commander, Lieut. Commander Dickinson, earned the everlasting gratitude of the gang by transporting the competitors to and from Peekskill in all the pomp and splendor of a man-o'-war, sleeping and feeding them in the bargain.

The Knights of the Springfield embarked late Saturday evening, the vessel proceeding up the big river during the early part of the night, to the range, where it anchored with the poker game below decks still in full blast and the snoring chorus at its height in the bunks.

Firing began at ten in the morning, the day being windless and ideal except for a haze which later in the day pulled many an auspiciously begun score to tatters.

The contingent of fifty-odd shooters included members of the Manhattan Rifle and Revolver Association, the Brooklyn Rifle Club—whose president, Len Miller, was suspected of having laid the egg out of which the party was hatched. There also were delegations from 71st, 13th and 23d Regiments, while others had come from Bayonne, N. J., and the Westchester Club.

The qualifying scores made at 200, 300, 500 and 600 yards slow fire, and 200, 300 and 500 yards rapid fire, included:

Miller, Brooklyn R. Club, 315; Coler, Brooklyn R. Club, 314; Corsa, Brooklyn R. Club, 312; Lahm, Manhattan R. & R. Club, 304; Gabhard, Brooklyn R. Club, 303; Landrock, Manhattan R. & R. Club, 300; Manville, Manhattan R. & R. Club, 297; Strain, Brooklyn R. Club, 297; Dietz, 71st Regiment, 295; Vanderputten, Brooklyn R. Club, 293; Case, Brooklyn R. Club, 293; Murray, 23d Regiment, 292; Korb, Brooklyn R. Club, 286; Kerrigan, 13th Regiment, 286; Sinclair, Manhattan R. & R. Club, 285; Lieut. Com. Dickinson, 2d Bat., 283; Black, Brooklyn R. Club, 282; Adkins, Brooklyn R. Club, 280; Vickers, 13th Regiment, 278; St. Johns, Brooklyn R. Club, 278; Becker, 13th Regiment, 276; Scott, Manhattan R. & R. Club, 267; Blecher, Brooklyn R. Club, 266; Dawson, Brooklyn R. Club, 264; Voltman, Manhattan R. & R. Club, 262; Willis, Brooklyn R. Club, 253; Anderson, Brooklyn R. Club, 249; Tollner, Brooklyn R. Club, 242.

SCHEDULE

N. R. A. Gallery Rifle and Pistol Matches, 1921-1922

Period	Event	No.	Range	Type	Ent. Fee	Entries Close
Dec. 3-Dec.	24 Prone Team Match	1 (R)	75 ft.	8 man	\$ 5	Nov. 20
Dec. 3-Dec.	24 Prone Team Match	5 (R)	50 ft.	8 man	5	Nov. 20
Dec. 3-Dec.	24 Kneeling Team Match	2 (R)	75 ft.	8 man	5	Nov. 20
Dec. 3-Dec.	24 Kneeling Team Match	6 (R)	50 ft.	8 man	5	Nov. 20
Dec. 3-Dec.	24 Sitting Team Match	3 (R)	75 ft.	8 man	5	Nov. 20
Dec. 3-Dec.	24 Sitting Team Match	7 (R)	50 ft.	8 man	5	Nov. 20
Dec. 3-Dec.	24 Standing Team Match	4 (R)	75 ft.	8 man	5	Nov. 20
Dec. 3-Dec.	24 Standing Team Match	8 (R)	50 ft.	8 man	5	Nov. 20
Jan. 14-Feb.	11 Slow Fire Pistol Match	1 (P)	20 yds.	Indiv.	1	Jan. 2
Jan. 14-Feb.	11 Rapid Fire Pistol Match	2 (P)	20 yds.	Indiv.	1	Jan. 2
Jan. 14-Feb.	11 Pistol Championship	3 (P)	20 yds.	Indiv.	1	Jan. 2
Jan. 21-Feb.	4 75-Foot Individual Championship	17 (R)	75 ft.	Indiv.	1	Jan. 10
Jan. 21-Feb.	4 50-Foot Individual Championship	18 (R)	50 ft.	Indiv.	1	Jan. 10
Jan. 21-Feb.	4 50-Foot Individual Championship	18 (R)	50 ft.	Indiv.	1	Jan. 10
Feb. 15-Mar.	25 Civilian Interclub Team Championship	9 (R)	75 ft.	5 man	10	Feb. 5
Feb. 15-Mar.	25 Civilian Interclub Team Championship	13 (R)	50 ft.	5 man	10	Feb. 5
Feb. 15-Mar.	25 Military Unit Team Championship	10 (R)	75 ft.	5 man	10	Feb. 5
Feb. 15-Mar.	25 Military Unit Team Championship	15 (R)	50 ft.	5 man	10	Feb. 5
Feb. 15-Mar.	25 Military and High School Team Champ.	11 (R)	75 ft.	5 man	10	Feb. 5
Feb. 15-Mar.	25 Military and High School Team Champ.	16 (R)	50 ft.	5 man	10	Feb. 5
Feb. 15-Mar.	25 Intercollegiate Interclub Team Champ.	14 (R)	50 ft.	5 man	10	Feb. 5
Mar. 4-Apr.	1 Pistol Team Match	4 (P)	20 yds.	5 man	5	Feb. 20
Apr. 2-Apr.	9 Standing Position Match	19 (R)	50 ft.	Indiv.	1	Mar. 28
Apr. 2-Apr.	8 Standing Position Match	23 (R)	75 ft.	Indiv.	1	Mar. 28
Apr. 2-Apr.	29 50-Foot Grand Aggregate	27 (R)	50 ft.	Indiv.		
Apr. 2-Apr.	29 75-Foot Grand Aggregate	28 (R)	75 ft.	Indiv.		
Apr. 9-Apr.	15 Sitting Position Match	20 (R)	50 ft.	Indiv.	1	Apr. 4
Apr. 9-Apr.	15 Sitting Position Match	24 (R)	75 ft.	Indiv.	1	Apr. 4
Apr. 16-Apr.	22 Kneeling Position Match	21 (R)	50 ft.	Indiv.	1	Apr. 11
Apr. 16-Apr.	22 Kneeling Position Match	25 (R)	75 ft.	Indiv.	1	Apr. 11
Apr. 23-Apr.	29 Prone Position Match	22 (R)	50 ft.	Indiv.	1	Apr. 18
Apr. 23-Apr.	29 Prone Position Match	26 (R)	75 ft.	Indiv.	1	Apr. 18
May 1-May	6 The Astor Cup Team Match	12 (R)	50 ft.	10 man	5	Apr. 25

INSTRUCTORS' CAMP HELD

BY EARLE V. HITCH

"WE have always relied," said President Wilson in 1914, "on a citizenry trained and accustomed to arms."

Now the War Department and the adjutants general of a number of states, acting on the authority of the new national defense act, have taken up the task of actually training and accustoming this citizenry to arms.

In an authorized statement from the War Department, issued last August, it was said:

"It is our traditional military policy that we are to maintain a small regular or standing army in time of peace, and this small peace establishment is to be augmented or reinforced by great armies of citizen soldiers when a national emergency calls for greater forces."

Such a policy, it would seem, is entirely in accord with the administration's program for armament limitation.

One of the most important factors in a trained citizenry is the National Guard and the State of Indiana is one among several states which are really coming to the front with measures to make this branch of our military system effective and efficient.

A special Small Arms Firing School, exclusively for members of the Indiana troops, has just been closed. The school was conducted at Culver Military Academy, under the direction of Major Basil Middleton, the senior instructor in marksmanship at Culver Academy.

Special training in rifle and pistol firing was given through a two-weeks' course of intensive study in theory and actual practice. In addition to firing instruction there were also demonstrations and lectures in range construction and care of ordnance. The course was designed to teach men to become rifle instructors in their own units, and it was worked out by Major Middleton and Adjutant General Harry B. Smith, of

Indiana. Each company and battery commander was ordered to appoint the best prospective instructor from the ranks of his non-commissioned officers, and these men were enrolled in the school.

The guardsmen were organized into a provisional company and they observed the same regulations as the Culver cadets. They were given physical drills and calisthenic exercises daily and about four hours' work on the range. A similar amount of time was spent in theoretical work and there was a nightly study period of two hours.

Thirty-one companies and batteries were represented in the school and it is expected that these men will go back to their units and begin teaching marksmanship. A number of companies that have not established rifle ranges will do so at once under the direction of their newly qualified instructors.

The Culver school opened October 16 and it attracted wide attention. So far as could be learned it is the first such school held since the war. One of the most interested visitors who went to Culver to see the plan in operation was Col. Smith W. Brookhart, president of the National Rifle Association.

Col. Brookhart spent two days observing the work and he was unstinted in his praise of the training. He declared he believes Indiana has taken a great step forward in bringing the state troops up to a high standard of efficiency by schooling rifle instructors in this manner. Col. Brookhart congratulated the authorities of Culver Military Academy on their cooperation with the state adjutant general and expressed hope that the work could be continued at regular intervals.

All of the target facilities of the academy were made available to the school, including an indoor and outdoor range. The Culver indoor range is said to be one of the best school ranges of this kind in the country.

Major Middleton, the commandant of the school, is the instructor of the Culver rifle team, which last spring won the national

shooting trophy, offered by the War Department to the winners of the championship in the ten weeks' shoot between the military schools of the United States. He is one of the foremost rifle experts in the country and was one of the instructors at the first firing school at Camp Perry, Ohio. For the last several years he has coached rifle teams which participated in the national rifle matches.

A NEW SHOTGUN LOAD

A NEW load came to our attention a few days ago that we feel sure all lovers of shooting will be much interested in. The principle of progressive combustion in smokeless powders, which has been quite extensively used in connection with rifle ammunition since its development during the World War, is now being applied to shotgun ammunition.

Before the development of progressive powders, the ordinary propellant powders would upon ignition develop their maximum pressure within a distance of 3 to 10 inches in the barrel of the arm in which they were fired. The progressive powders were so treated as to retard the combustion and instead of developing a maximum pressure so quickly, the combustion was more gradual and carried out over almost the entire length of the barrel.

The use of the progressive burning powders now permits the loading company to take advantage of the decrease in pressure to increase velocity without reaching a dangerous pressure, with the result that there is being offered a 12-gauge Field 1¼ oz. load known as "Super X." A higher velocity, with from 15 to 20 yards added effective range and a superior pattern, is claimed for the new ammunition.

This shell is loaded with ounce and a quarter of shot whereas the most effective load at the present time so far as velocity is concerned is 3½ dr. 1 oz. load. With the Super X load they are able to deliver 1¼ oz. shot at a range exceeding 3½ dr. 1 oz. load, with the result that more pellets of shot are obtained for use at the extreme ranges. The pressure developed is about equal to the pressure obtained in the standard trap load now in use. At the present time this load is put on the market in Nos. 2, 4 and 6 Chilled Shot, in a 2¾ length shell.

GERMAN 22's IN ENGLAND

FROM notes appearing in British sporting sheets, it may be inferred that the ammunition makers of Germany have again invaded the English market. It will be recalled that the Rheinisch-Westphalian small-bore cartridges were quite generally used by many small-bore shooters prior to 1914.

One of the leading shooting publications of Great Britain makes this announcement in a recent number:

"We understand that the slight defectiveness of the original consignment of R Championship ammunition was caused through damage by sea water during transit. The whole of the balance of this consignment has now been rejected and returned to the manufacturers for breaking up, and the new consignment, received in its place, has been thoroughly tested and found to give excellent results. Furthermore to conform with the great demand for a cheaper brand of good quality the price has been substantially reduced from 29 s. to 25 s. per 1,000.

"Last month in this column we had the satisfaction of announcing the great reduc-

tion in the price of the Dominion Long Rifle Smokeless Ammunition and this month follow it with the information that the Eley Best Long Rifle Smokeless has now been reduced from 30/- to 22/- per thousand, thus enabling our members to obtain a reliable British brand of smokeless ammunition at much reduced cost."

THE HAVERSACK KIT

I AM enclosing some photographs of a "Rifleman's Kit" which I have constructed out of a haversack and which I am using with a great deal of satisfaction," says R. G. Rodman, of Cherokee, Iowa.

"You will note that the bayonet scabbard has been replaced by a cleaning rod case, Model of 1916, to which has been attached a double hook, and which contains a Model of 1916 jointed cleaning rod.

"Pockets are constructed on the inside of the haversack to hold the various and sun-



How It Looks as a Shooting Bag

dry articles a rifleman deems indispensable. Among other things, I carry a micrometer, shoulder and elbow pads, cleaning patches, "Hoppe's No. 9," and a spare part container with contents.

"The meat can pouch is used as a receptacle for score books, pipe, tobacco, cigarettes, etc. (You can construe 'etc.' as meaning anything you want, if you can get it.) I also carry a piece of cardboard, cut to fit the pouch, to which a piece of celluloid has been bound with tape. Between the cardboard and celluloid I insert a sheet of paper containing some condensed windage and elevation rules and tables. The pockets in the meat can pouch, which were designed for the 'eating tools' and scabbards, are utilized as containers for pencils and fountain pen.

"The haversack will also contain numerous other articles, such as extra clothing, and may be used with the pack carrier the same as before conversion.

"A person is pretty sure to wear a cartridge belt to the range and, even if you don't 'hike' out there, you do more or less walking around while there."

NEW ARMS CO. FORMED

A NEW company, known as the Marlin Firearms Corporation, has purchased the former Marlin Firearms plant in New Haven, and has acquired all of the machinery, tools, fixtures, gauges, patents, good-will, inventory, etc., of the Marlin firearms business, which has heretofore been conducted by the Marlin Firearms Company and the Marlin-Rockwell Corporation.

The business was originally established in New Haven by John M. Marlin, in 1870, and was carried on successfully by the Marlin family until 1916, at which time the plant was acquired by the Marlin-Rockwell Corporation and used principally for the manufacture of machine guns throughout the war. The Marlin plants were recognized as the largest producers of machine guns in the world.

The new corporation will manufacture the full Marlin line of repeating rifles and repeating shotguns, also single shot rifles, single guns, double guns and revolvers.

The work of reorganization is already under way and the company expects to progress rapidly, reestablishing the business so that within a short time the plant will be able to operate with a force of three hundred (300) or more men in regular production.

The Marlin Firearms Corporation was organized under the laws of Delaware and has an authorized capitalization of 14,000 shares of preferred stock (par value \$50 per share) and 27,500 shares of common stock.

The president of the new company, John F. Moran, is no new-comer in the firearms game, having been associated with the old Marlin company for many years.

CONCERNING THE REISING .22

By Marcellus Rambo

ALL who have purchased one of these pistols are pleased with their accuracy and balance. However, the pistol possesses a serious defect as it comes from the factory that, under certain conditions, renders the arm perilous to all in its vicinity.

The defect is that the over-all length of the firing pin is too great. For should the hammer be let down all the way, there being a cartridge in the chamber, the hammer will be SUPPORTED by the printed rim of the cartridge, and is not resting, as many suppose, against the rear face of the slide, as it does in the service automatic pistol, Cal. .45, Model 1911 (Colt automatic pistol, Cal. .45, Govt. Model).

This is due to the fact that when the firing pin is resting against the rim of the unfired cartridge, the other end is projecting beyond the slide, a distance it must be driven forward by the hammer to fire the cartridge.

The obvious thing to do is to shorten the firing pin, so that when the front end is in contact with the rim of an unfired cartridge the rear end is flush with, or better, a little under the rear face of the slide, thus insuring that when the hammer is down it rests against the rear face of the slide, and not against the unfired cartridge, thus eliminating all danger of an accidental discharge due to the hammer receiving an accidental blow from a fall or otherwise.

To shorten the firing to the proper length proceed as follows: Cock the hammer, scratch a mark on the projecting rear end of the firing pin flush with the rear of the slide. This gives the distance the modified pin must project beyond the rear end of the



SCORE BOOK

By Riflemen, for Riflemen

Will be as valuable to the competitor in the

N. R. A. INDOOR RIFLE AND PISTOL MATCHES

as it has been proved to be to the service rifleman. Targets must be sent to N. R. A. Headquarters for Scoring; keep your permanent records on the small-bore score sheets of this book.

LOOSE LEAVES, STIFF BACK, CONVENIENT POCKET SIZE

Largest plotting targets obtainable with ample space for all data necessary in recording scores of **All Military, Sporting and Small-Bore Rifles, Revolvers and Pistols.**

One out of every three competitors at the National Matches used the new N. R. A. Score Book under match conditions and found it right.

THE BEST AT THE LEAST COST

Score Book complete with assortment of all sheets, 50 cents

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The National Rifle Association of America

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Washington, D. C.

slide. Note this distance. Drive out the firing pin retaining pin, remove firing pin, remove firing pin spring from firing pin. Note, care must be taken that the firing pin does not jump out at the moment of release, causing the loss of the firing pin spring. Replace firing pin, less spring, in its well, bring the front end of the firing pin flush with the surface of the firing pin hole; while in this position scratch a mark on the firing pin flush with the surface of the well. Remove and then cut off rear end of the firing pin to an 0.03 inch beyond this mark. Smooth rear end, put on spring, and assemble in the slide. Now, note if the rear end projects the same distance it did before being shortened. If it does not, note the distance it lacks. Remove the firing pin and lengthen the flat surface found on the body of the pin, the distance the rear end lacks, cutting from the front end only. Assemble.

It will be found that after this modification the hammer can be let down on the loaded chamber and hammered, and the pistol will not be discharged. The impact of the hammer against the shortened pin will drive it forward sufficiently hard to detonate the priming.

While at Camp Perry the past summer, at my suggestion, the representative of the Reising people helped me modify one of these pistols, and I shot it two hundred times, both slow and rapid fire, and did not have a single misfire.

Revolver Supply Exhausted

THE Director of Civilian Marksmanship announces that the supply of Colt revolvers, caliber .45, both single and double action, has become exhausted; therefore, it will not be possible to fill any more orders for these arms.

Frequent inquiries have been received in regard to the Ross rifles that are available for sale at \$5.00 each by the Office of the D. C. M.

These rifles are the Canadian Ross, mili-

tary model, using the British Mark VI .303 cartridge, loaded with about 32 grains of cordite and a round nose bullet weighing 215 grains. This cartridge is very much like the Krag cartridge and gives about 2,000 f. s. velocity.

The rifle has a 28-inch barrel rifled with four grooves .004 deep and has a uniform twist of one turn in 10 inches. It has a full length pistol grip stock with a slightly curved butt plate. The front sight is similar to that on the Springfield and the rear sight can be adjusted for both elevation and windage. The rifle without bayonet or sling weighs 8.15 pounds.

These rifles are in second-hand condition and, of course, cannot be guaranteed. The Ordnance Department has no ammunition for these arms.

Running a Turkey Shoot

SEEING an inquiry in ARMS AND THE MAN about running a turkey shoot, let me tell you how they used to run them in northern Vermont up to 1906, when we left there. We had a range close to the village hotel, and the farmer who raised the turkeys always ran the shoot. He would bring the turkeys and put them in the hotel barn. The man who won the first turkey in the morning got ticket No. 1; the second man No. 2, and so on. When the shoot was over the man with ticket No. 1 got first pick; the man with ticket No. 2 got second pick, and so on down the list. That made it quite an inducement to make your first shots count, like you have to if you get the game.

The range was 200 yards, target, Standard American. Any rifle could be used, but about all were repeating hunting rifles such as they used to hunt deer: 30-30, 32-40 and 38-55's leading at that time. The farmer set the same price on all the turkeys. While I am only thirty-one years old I remember when they went for a dollar each.

We will say there were ten men there, that was about the usual number, and when he got only \$1.00 each, each man paid 10 cents for one shot at the target. The man whose shot counted highest got the turkey; ties were shot off. The shoot was held the Saturday before Thanksgiving. Your sights had to be adjusted to suit a barrel always cold, as the weather was always cold then, and it would always get as cold as the air between shots, as fair for one as another, besides it made a great school for deer hunters.

H. GUY LOVERIN, Rutland, Mass.

BISLEY, 1921

(Continued from page 12)

again when the "Donegal" and "Conan Doyle" showed a larger entry than the previous year of old competitors. Again, there were many men and women shooting in these rifle club competitions who had learnt their shooting with the miniature rifle, and it was by no means the first occasion that I had the pleasure of witnessing success by persons who had hitherto interested themselves wholly in miniature rifle practice. Going on to the S. M. R. C. London meeting from Bisley it was indeed a pleasant sight to witness many ladies shooting well, and I noticed one girl with plaited hair scoring cartons while a fellow competitor was perforating the eight and nine circles too frequently for his peace of mind. There was coolness and determination shown by this girl which would delight an old coach and I hope the county which sent her will unearth many more of such a type next year. The women shots at Bisley did not carry off the top prizes; they may not have finished in the first half a dozen, but I noticed that one scored six "bulls" and an inner in seven shots and the heat of the day was almost intolerable.

We cannot place too much importance upon any organized system of county ri-

For the N. R. A. Gallery Matches

COLT

.22 calibers

Revolver or Automatic
Pistol.

Both conforming with
all General and Special
regulations governing the
gallery matches.

Each with individual
records of previous vic-
tories.

Especially adapted for the
Rapid Fire Matches as the
entire string can be shot with-
out reloading for each shot—
a feature you will also appre-
ciate in cold weather, when your
fingers are numb and stiff and
.22 cartridges are hard to
handle.

Ask for the 1921 Camp Perry
folder and sample target.

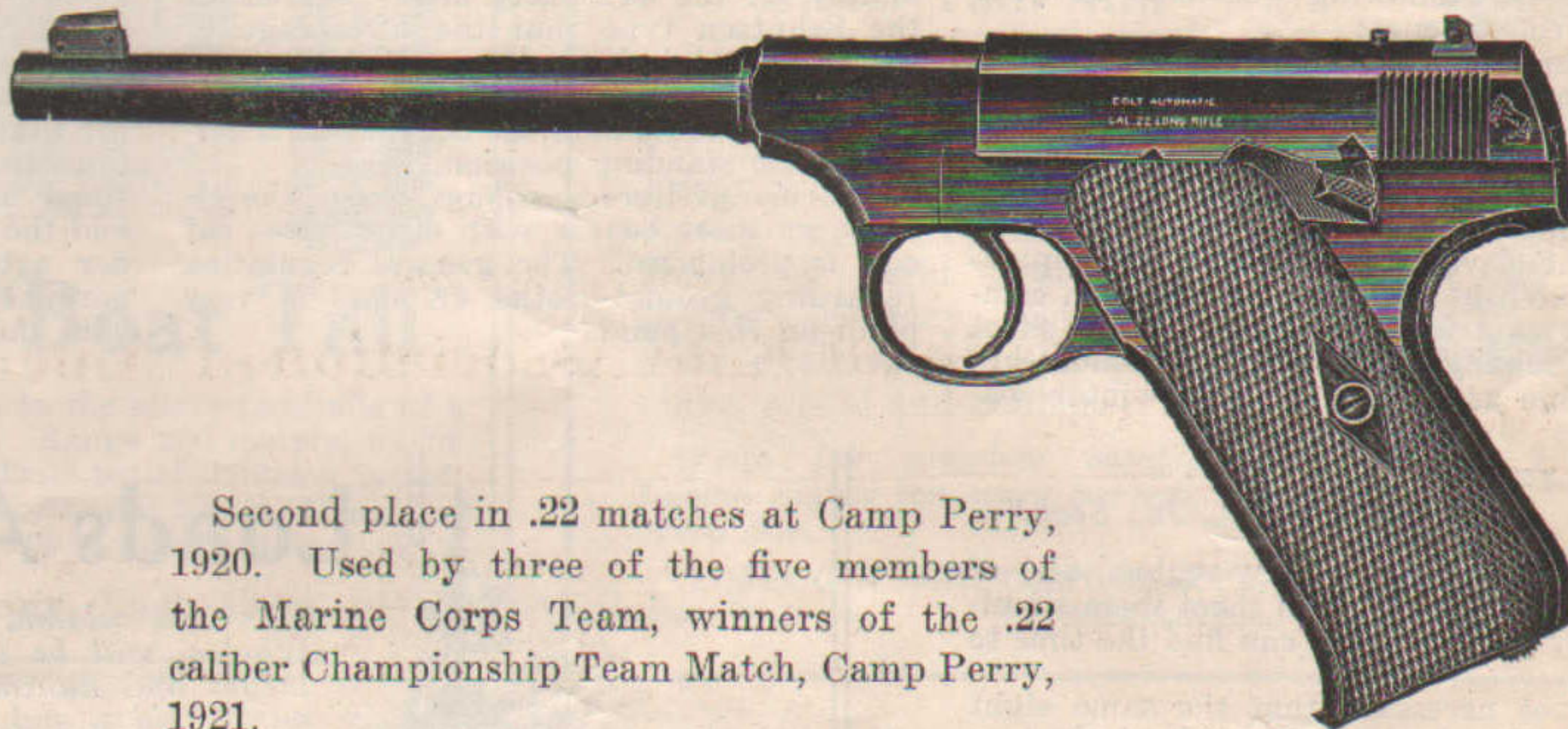
Colt's Pat. Fire Arms Mfg. Co.

Hartford

Conn.



COLT Police Positive Target Revolver.
Winner at Wakefield, Mass., 1910.



Second place in .22 matches at Camp Perry,
1920. Used by three of the five members of
the Marine Corps Team, winners of the .22
caliber Championship Team Match, Camp Perry,
1921.

valry, and we are indebted to the English XX. Club for reviving the county championship event or the shoot for King George's challenge cup. The competition, which was held during the first week, interested teams from Cambridge University, Derbyshire, Devonshire, Essex, Hampshire, Kent, Lancashire, City of London, County of London, Sussex and Oxford University. Extraordinary keenness was shown by the various captains who were indefatigable in coaching their sides. London County won, as was expected, but the city made a gallant attempt to pull it off.

There were many incidents throughout the meeting which were duly reported in the press, and are therefore as dead as the proverbial cold mutton. Everybody knows that the genial Northumbrian bonafice sucked plums and scored bulls at the 1,000 yards range and won the "King's" and the Major Richardson, a brilliant exponent of yesterday—and in fact one of the best today—was quite annoyed because his cigarette had gone out while he was paying particular attention to the scoring of the last of his fifteen bulls in a certain competition. This charming atmosphere of sang-froid is not by any means unusual at Bisley. Were it so, we should not hear so much of those monotonous strings of bulls which are constantly being registered when the "cracks" are down. However, there was one strange incident on the second day which is well worth recording.

During the shooting for the Whitehead Memorial, a match rifle event at 1,100 yards range, a competitor challenged and lost and consequently deposited his half a crown beside him in readiness for the range officer. As this official did not arrive, and it was again his turn to fire so the competitor again aimed. He was on the point of squeezing off when the range officer came along and asked for the fine. The register keeper indicated that the coin lay beside the firer. Apparently dissatisfied the official again appealed for the fine and the competitor came down from the aim, withdrew the bolt sharply and ejected the cartridge, paid the half a crown to the official and then searched for the ejected cartridge. Being unable to see it among the empties and in order to save time, placed another round in front of the bolt and jammed it into the barrel. The lugs caught, but the bolt did not go quite home, although with a little extra force it undoubtedly would have done so. Instead of using this extra force he wisely opened the bolt and on extracting the cartridge and looking through the bore found that the bullet of the previous round had been left in the lead of the barrel when the case was ejected. It was understood that the particular barrel was one of those in which last year the lead was lengthened by 0.75 of an inch, which fact undoubtedly accounted for the bullet being able to travel

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Magnification of sights altered for special
shooting conditions.

J. W. FECKER

7612 Linwood Ave.

Cleveland, O.

so far into the barrel. The bullet of the second round was pushed backwards into the case, and the length of the cartridge was thus reduced, while the first bullet was pushed some way into the rifling. The point of the second bullet was also pushed into the lead base of the first for a short distance. This chain of events resulted in the possibility of loading a cartridge behind a bullet which had become seated on extracting the previous round. Considerable force had to be applied to the bolt, but "tight fits" frequently occur in a close gripping match rifle action, and the additional force necessary to load the second round was apparently little out of the way. The two factors which really made this double loading possible were, first, the exceptional length of the lead of that particular barrel, and secondly, the backward seating of the second bullet into its case. Luckily the round was not fired or a very serious accident would probably have resulted. The combination of circumstances no doubt was a rare one, but the possibility should ever be borne in mind.



Regulations and Decisions Rifle and Pistol Gallery Competitions

THAT interest in the coming indoor matches is running high is evidenced by the numerous inquiries concerning the competitions which are reaching the N. R. A. from the leading rifle clubs of the country.

One is from the Mound City Rifle Club of St. Louis. The Secretary says:

"At a recent regular monthly meeting of the Mound City Rifle Club, a number of questions were raised as to the construction to be put on certain phases and conditions surrounding the indoor N. R. A. matches for the seasons 1921-22.

"I request therefore that we receive a reply to the following questions at your earliest convenience:

"Concerning Matches 1, 2, 3 and 4, can one team of 8 men enter all 4 matches and shoot them simultaneously? I think that I am correct in my belief that the team must be composed of the same 8 men throughout the season.

"In the Civilian Inter-Club Championship (Match 9) must the same 5 men compose the team for the duration of the shoot or is interchangeability of team membership permissible as during the past winter season?"

Yours very truly,

"E. D. CAMPBELL, JR., Secy."

Answer: One team may enter all of Matches 1, 2, 3 and 4, and shoot them simultaneously provided they can find the time to do so.

It is not necessary that the same eight men comprise the team throughout the season, or that the same five men must comprise the Civilian Interclub team. The general regulations permit a change to be made in the personnel of the team before the commencement of any stage of the series of matches, but no change can be made after the team has commenced shooting for the night.

The use of palm rests and sand bags brought inquiries from the Miami Ohio Rifle Club. Here are the questions asked by the Secretary of this organization:

"In reference to the program for gallery shooting this season as referred to in the October 15 issue of ARMS AND THE MAN, we desire to ask one or two questions concerning the different positions.

"We note that in all positions the rifle will be supported only by the shoulder and hands, barrel swinging free. By this we would understand that no palm rests will be permitted this season, but we are not certain on that subject, as it might be construed that a palm rest is a regular part of the rifle. Please inform us fully on this subject; also as to just what is meant by the barrel swinging free, as we expect to shoot in some of these matches, and as heretofore, we wish to do so strictly on the level. Of course, if others are permitted to use palm rests, we will do the same.

"We would also like to know whether we are permitted to use light sand bags under the elbows as a protection when shooting prone, and in case we are not we would then like to ask whether we are permitted to use that which is used by a great number of prone shooters, i. e., a short board with holes cut through the proper distance for the elbows to sit in.

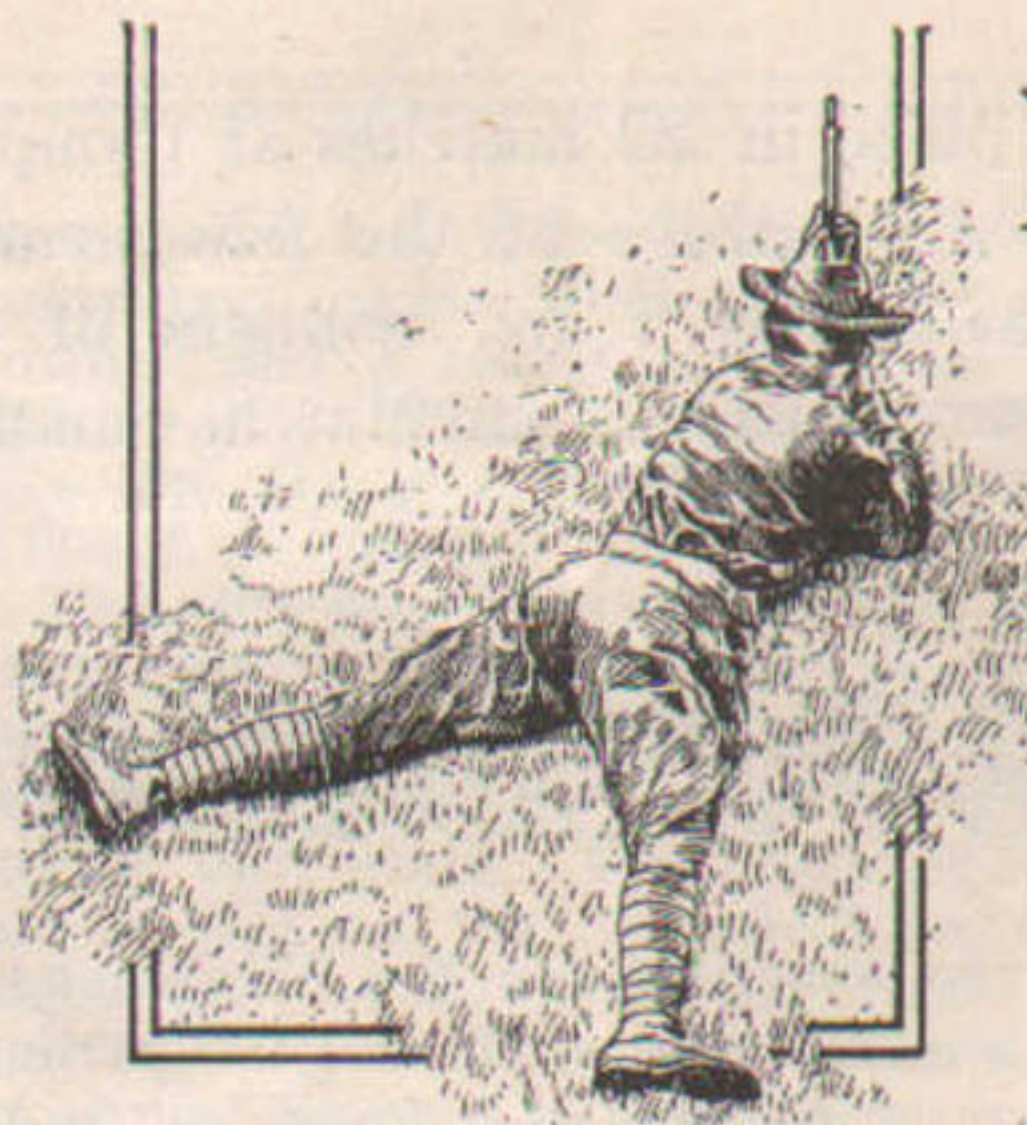
"Also please state whether the elbow may be rested against the body when shooting in standing position.

"C. E. BOYS, Secy.-Treas."

Answer: By the definition "barrel swinging free" is meant that the barrel or fore end of the rifle must in no manner be rested against any brackets, sandbags, or artificial support.

We have placed no restrictions upon the use of palm rests, as it does not seem necessary to do so. In our opinion, and I think we will be supported by the majority of the riflemen, a palm rest is of absolutely no advantage in a light-weight rifle. It is mainly on the extremely heavy barrels of the Schutzen type that the advantage of the palm rest is brought out. In this connection, we will also say that the elbow may be rested against the body when shooting in the standing position.

The use of light sandbags under the elbows, or short boards with elbow holes cut out, is prohibited. The general regulation regarding ground cloths or mats is very plain on this point.



Loads And Re-loads

In this column, conducted by Major Townsend Whelen, will be answered inquiries pertaining to target and hunting small arms, hunting licenses, game guides, and kindred subjects. An effort will be made to reply to inquiries direct by mail before the appearance in this column of the answer. The service is free to all, whether the inquirer is a subscriber to Arms and the Man or not. All questions are answered at length by mail. Those portions of general interest are published here. Every care is used in collecting the data for these answers but no responsibility is assumed for any accident which may occur.

HAVE an old Winchester single-shot 25-20, octagon barrel, $\frac{7}{8}$ inch thick at breech, damaged in chamber through removing broken shell. How would it do to bore the barrel and chamber for .38 Cal. long Colt revolver cartridge, just to take advantage of the present low price from the War Department of this ammunition, particularly for the boys and the ladies who find the Krags and Springfield too heavy?

C. J. M., Bristol, Conn.

Answer: Reboring the 25-20 Winchester single shot for the .38 long Colt cartridge is entirely practicable of course, but there are several reasons why I do not think it would be worth while doing it. First, the calibre .38 long Colt cartridge was never a very good cartridge. It is designed entirely for the revolver. The powder all burns in about 8 or 9 inches of the barrel, and the extra length of barrel will simply add to the friction and be of very little advantage. It will not be at all accurate. Also, the cost of reboring a rifle for an odd size like this is very expensive indeed. It costs more to rebores a rifle than it does to make an entirely new barrel to order, because the new barrel can be made with the regular set-up on the boring and rifling machines, whereas to rebores and rifle an old barrel requires the most expensive man in the shop to set up the machines particularly for this job, and it takes the machines out of regular production for that length of time. I should not wonder if you found that it would cost you in the neighborhood of \$100.00 to have your rifle rebored for that cartridge, because in addition to

all the work detailed above, new boring and reaming tools and rifling cutters would have to be made for this barrel. It would be very much cheaper indeed to order a barrel from the Winchester Company for some standard cartridge.

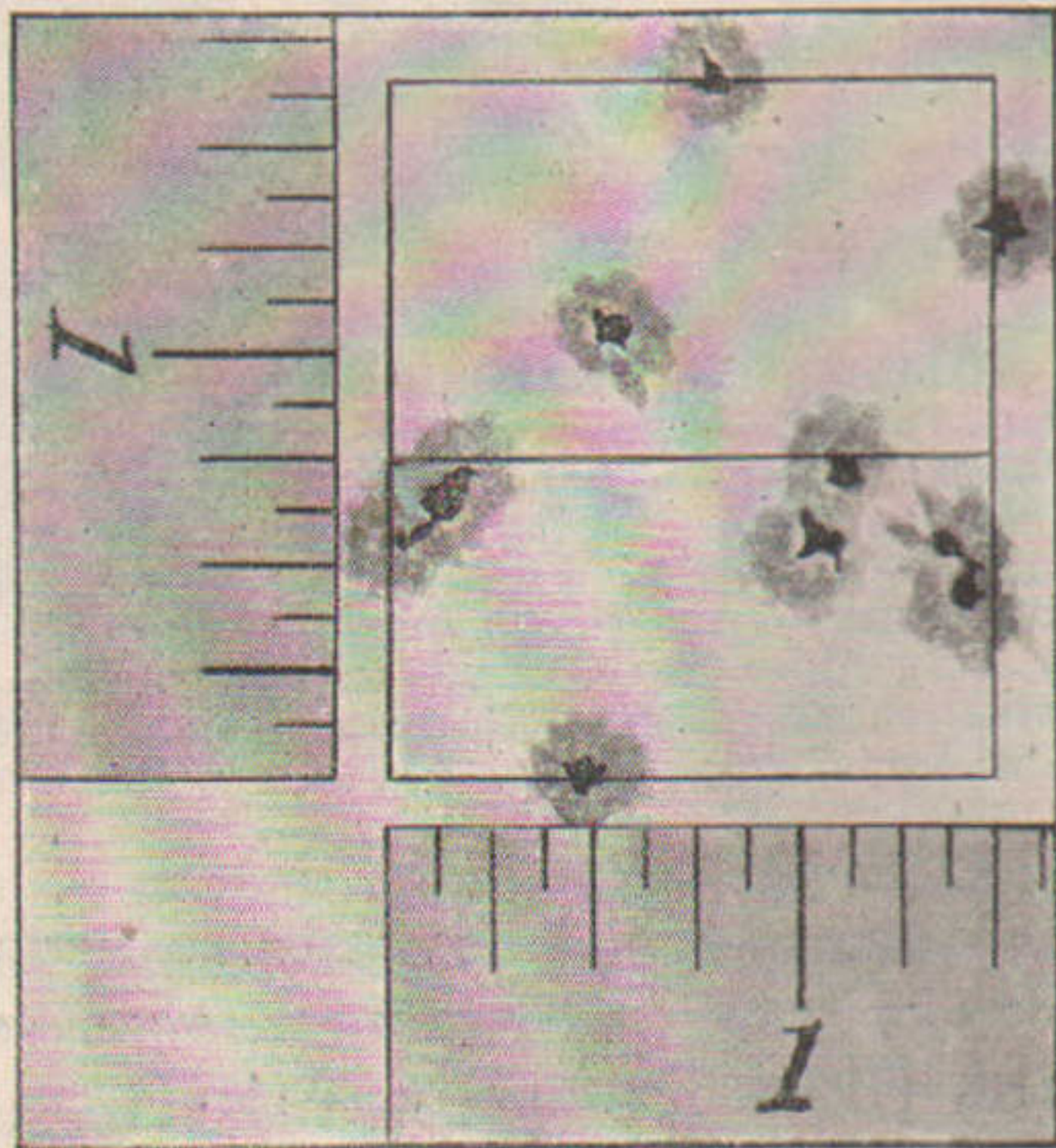
WHAT in the muzzle velocity of the old 50-70-450 Govt. cartridge when shot from a 32-inch barrel? Height of trajectory at 100 yds., 200-yard shooting? What 10-shot group would you consider good work with this cartridge in a good rifle at 200 yards?

At what velocity must a bullet travel in order to produce sufficient vacuum in its wake to cause the sharp report heard in target pit?

About what percentage of loss in power do you estimate is caused by the joint between cylinder and barrel of a well-fitted revolver of .38 Special calibre?

I have a '98 Krag rifle, purchased new about 20 years ago, with a case of F. A. ammunition, loaded with the old "3-groove lubricated" bullet. I did not use this rifle until recently, and I find upon caliper-ing a lead bullet pushed through the bore, that it measures .3093 to bottom of grooves, while the bullets average .3068. Although the barrel is large, it is a good, smoothly bored cylindrical one with no tight or loose places, and seems to do good work at 500 yds., which is the longest range I have shot it. I have been using a very hard grease (used as a lubricant on locomotive crank pins and driving axles) of the consistency of soap, carefully applied to bullets, thinking this might reduce erosion of bore near cham-

It's Some Bullet



The *Western* "Boat Tail"

The figures below are in reference to the above facsimile of a target made with this new bullet. Range 200 meters, 30 '06 Springfield rifle, 180-grain "Boat Tail" bullet, Lubaloy jacket. Extreme vertical 1.63 in. Extreme horizontal 1.47 in. Mean vertical deviation 0.35 in. Mean error 0.99 in. Mean radius 0.63 in.

Western Cartridge Company, East Alton, Ill.

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FIRST you want a rear peep sight, preferably mounted on the tang, because that gives you the greatest possible sighting distance, thus increasing accuracy. Next you should have a hooded front sight in preference to an ordinary metal bead. The hood protects the front sight from possible injury and also shades it from confusing light effects.

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(b) Target Front Sight No. 7 with lateral Windgauge Adjustment. Has reversible globe and peep protected by large hood, \$4.50.

ber, and the fact that the grease is not burned up as readily as the common automobile cup greases, is shown, I think, from the fact that the muzzle becomes smeared with a pasty substance (partly consumed grease, evidently) after firing a few rounds, while after the application of "Mobilubricant" to bullets, the muzzle appears practically as dry as when shooting dry bullets. Do you think this grease, or soap, rather (for it will "lather" to a certain extent when rubbed with the hand in water), will prolong the barrel life?

I have refrained from using this grease in my Model 1903, as it is such a stiff grease I thought it might increase density of loading sufficient to create dangerous pressures. Would you consider it safe to use with 150-grain bullets?

My ammunition for the Model 1903 was loaded in 1909. Some is marked "Lot No. 206—DuPont Pyrocellulose" and some "Lot No. 218—L. & R." Bullet is 150-grain, with no cannelure. How does this compare in accuracy with present-day loading?

C. T. L., Gardner, Mass.

Answer: The muzzle velocity of the old 50-70-450 Government cartridge, when shot from a 32-inch barrel, was approximately 1325 f. s. The height of trajectory at one hundred yards, when shooting at two hundred yards, was about 12 inches. We consider that a ten-shot group in a 8-inch circle at two hundred yards is excellent for this rifle.

A bullet must travel at a velocity in excess of the velocity of sound, that is, in excess of 1080 f. s., in order to cause the sharp report heard in the target pit.

I do not know exactly how much loss in velocity would be caused by the joint between the cylinder and barrel of a .38 revolver. It would depend a good deal upon the kind of powder and upon the fit of cylinder and the fit of the bullet. I think it would probably average about 15 per cent loss.

I do not believe you will get good results from the old Krag ammunition loaded with 3-groove lubri-

cated bullet. Not only is the ammunition very old, but the bullet is too small, and the powder is very out of date and has nothing like the accuracy of present powders. New bullets for the Krag rifle all measure .308 inch to .3085 inch, and they should do very good work in a barrel which measures .3093 inch.

I would not use the grease you mention as a bullet lubricant either in the Krag or in the Model 1903 rifle. Our experiments show that the use of grease in the Model 1903 rifle raises the breech pressure about 12,000 pounds, and to a dangerous point, especially in these days when the brass we are getting for cases is not as good as the brass we obtained before the war. The Krag rifle, having but one lug, has not sufficient strength to stand a great increase in pressure; nor does ammunition at 2,000 f. s. velocity give any metal fouling making grease desirable. I think you would get your greatest accuracy life from your Krag barrel, not by using grease, but by using the Government Pyro D. G. powder, or Du Pont No. 20. With the 220-grain bullet, 36 grains of either of these powders should give you a very good charge with very little erosion, giving a muzzle velocity of about 2,050 f. s., and a pressure of about 41,000 pounds.

Your Cal. .30, Model 1906, ammunition which was loaded in the year 1909 with Du Pont Pyrocellulose and with Laffan & Rand powder will have a little more erosive effect than more newly made ammunition loaded with Pyro D. G. powder. This old ammunition will not compare at all with the present ammunition. For example, you would be lucky with the old ammunition if you were able to get a 25-inch group at 600 yards, whereas ammunition made this year at Frankford Arsenal will shoot into a 7-inch group at 600 yards.

I WOULD like your opinion regarding the 7.62 mm. Russian Service Rifle. Is this rifle safe? I notice that the bolt is not made in a solid piece and the receiver appears rather thin to me; also, are there

any lead alloy bullets on the market suitable for reduced loads in this rifle?

P. L. H., Glendale, Calif.

Answer: The 7.62 mm. Russian Service Rifle as made in this country is perfectly safe with its own ammunition. I would not, however, trust it with maximum loads that give pressures over 50,000 pounds. I think that with the full charge you had better confine yourself to the 150-grain bullet. These barrels are bored rather large. To do the best work, with a regular service ammunition, they should measure about .308 inch, but I think they run about .312 inch.

I should think that any lead alloy bullet which measures .313 inch and cast of 1 part of tin to 10 parts of lead, or harder, should do good work. There are a number of such bullets furnished for the .303 Savage rifle, and the .303 British rifle, which should do good work. The neck of the cartridge case should be expanded correct size for these bullets. I would suggest a charge of about 12 grains of No. 75 or No. 80 powder.

WILL you please inform me on the following subject: I have Krag rifle which is in first-class condition and practically new. What is the heaviest load of No. 16 powder that can be safely used in this rifle with a 150-grain bullet.

I also have a lot of 30-40 arsenal loaded cartridges that I would like to extract the bullets from. Do you think it would be safe to hold the bullet end of the cartridges as far up as the bullet is seated in the cartridge in boiling hot water? I believe this would soften the shellac and expand the cartridge at the neck enough to make extraction easy, but not knowing the nature of the W. A. powder under such a degree of heat, I dare not attempt it without further advice.

A. J. H., Towanda, Pa.

Answer: The heaviest charge of No. 16 powder which should be used in a Krag rifle that is in excellent condition, using the 150-grain service bullet,

is 45 grains, which will give a muzzle velocity of 2,800 f. s., and a pressure of 42,000 pounds.

Relative to the drawing of bullets from cartridge cases, I do not believe that dipping the case in boiling water will have any effect in making the bullet draw easier, and it may have a bad effect on the powder, but it could not cause an explosion. The best way to draw the bullets is to hold the cartridge in a die, such as a resizing die, so that it cannot be deformed, and then with some arrangement that will give a straight pull clamp onto the bullet and pull it straight out with an arbor press.

I HAVE purchased a 6.5 mm. Mannlicher-Schoenauer rifle and would like some information regarding same, as per following questions:

What companies now, or rather at the present time, are making cartridges for this gun?

Is there a pointed bullet made in this size for this rifle?

Can you give me the different bullet weights used with the full charge, and are all the bullets jacketed with cupro-nickel? What is the greatest velocity which can be gotten out of any commercial cartridge? In regard to this query the dealer advertises a load of a 141-grain bullet at 2,564 feet, but the only bullets I can get weigh 149 grains.

Last, but not least, what groups will an average shooter get with this gun at 100 and 200 yards; that is, with open sights as equipped and an 18-inch barrel?

C. M. M., Allegheny Co., Pa.

Answer: I have received your letter of the 16th inst., relative to the 6.5 mm. Mannlicher-Schoenauer rifle and its ammunition. So far as I know the only company in this country making 6.5 mm. Mannlicher-Schoenauer cartridges is the United States Cartridge Company. Their cartridge contains a 160-grain bullet with a blunt nose and cupro nickel jacket. The bullet has a diameter of .2025 inch. The powder charge is 35 grains of Du Pont No. 20 powder. The muzzle velocity in an 18-inch barrel is 2,150 f. s., and the energy 1,643 ft. lbs. The average Mannlicher-Schoenauer barrel has a groove diameter of 2.63 inch.

The foreign ammunition for this rifle varies greatly according to the maker. Even from the same importing concern you frequently find that they have on hand only one kind of ammunition, and that entirely different from what you got at first. There are several German firms who make ammunition loaded with the 123-grain Spitzer pointed bullet that has a velocity of about 2,575 f. s., but this velocity is taken in a 29-inch barrel, as are all the German velocities. The Germans also make bullets which weigh 141 grains and 157 grains, and probably a great many other weights in between. Every one of these cartridges of course shoot with a different velocity. Probably none of them will exceed 2,250 f. s. in an 18-inch barrel. They also each one require a different sighting of the rifle. With open sights as close together as they are on the 18-inch barrel, there is considerable variation in aim from shot to shot, even by an experienced rifleman. The German ammunition is loaded with powder which is not quite as stable as our own powders. I really believe that you will get good results from this rifle only when you stick to our own ammunition and put a Lyman receiver sight far back on the rifle. I think it is possible to take the cartridge case made by the United States Cartridge Company and load it with Du Pont No. 16 powder and the 129-grain open point expanding bullet made by the Western Cartridge Company for the .256 Newton rifle, and get very excellent results and probably velocities as high as 2,250 f. s. in an 18-inch barrel. In that barrel, however, you cannot get very high velocities. The high velocities of today are only obtainable with progressive burning powders, and those powders require long barrels to allow them to give their full velocities.

I should think that with a receiver sight and good American ammunition fitted to your rifle a first-class marksman should get 6-inch groups, or perhaps a little smaller, at 200 yards.

HAVE a 30-30 Remington auto. and desire to do reloading for this rifle. Now, the first point in question is this: .30 Remington bullets cost \$27 per thousand; Winchester .30 bullets cost \$10.50 per thou-

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IVORY BEAD \$1.00

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sand; both are same weight. Can be secured of practically same diameter. The only difference is in the crimping ring, which is immaterial as proper resizing and expanding will fix that up.

I have a letter with the following information: The Rem. Model '08, auto. loading rifle has a barrel having a diameter of .307. The .30 Remington bullet average .3056, the Government Springfield rifle has a barrel having a diameter of .308. The ammunition averages .3082. The 30-30 Winchester bullet averages .306. Why would the barrel have the diameter of .307 and a bullet .3065?

Again quoting same letter, "The U. S. Springfield bullet could be used in a .30 Remington auto. rifle, but might not properly work the action. You will have difficulty in securing the auto. action by using the plain lead bullet." Above, the statement is made that for the Remington rifle the bullet diameter is less than the barrel diameter. Now, the statement is made that a larger diameter could be used in this rifle. It appears to me that they have made a typographical error, as certainly the bullet diameter should be slightly larger than the barrel diameter. As the Springfield bullet has only a larger diameter of .0002, I could not see how a bullet of .001 could be used satisfactorily in this barrel.

I would like to know the results of using a bullet of one-half ten-thousandth under the diameter of the barrel. And if the Winchester bullet is of .306 their diameter of their barrel must be less. What would be the result of using a bullet of .308 with a barrel of .306?

Would it be necessary to resize the base of the auto. cartridge for the Remington auto. rifle each time they are fired in order to get proper results from the action? I have the following information from the Remington people in relation to this:

"The necessity of resizing any shell depends upon the charge of powder used. Consequently, we cannot give you any information on the point."

I have a Lyman 103 micrometer sight on my Springfield but do not like the lost motion. Will you please give me a little data in relation to the effects of this? What inaccuracy would it cause? Does the sight fall to the same position each time? Is there any way of correcting this? It appears that the sight falls to same position when working the

action. But it proves by touching that it will retain the position placed in often. A jar will cause the same results. I like this sight very much." It is preferable to the No. 48 for game and quick shooting.

I have an Ideal reloading tool for the Springfield shell. Have never used this, as I also have a Bond. Would like for you to explain this part of the action: it apparently has no device for expanding the shell. Then, if a person is using a shell of a different elasticity or thickness, it appears that much difficulty would arise in getting the proper size for holding the bullet firmly. It may be that there is an attachment to this tool for expanding, but have never seen one.

E. A. H., Clifton, Ariz.

Answer: I think you will find that the groove diameter of both the Remington and the Winchester 30-30 barrels is about .308 inch. While not knowing positively, I should say that probably one or both of these companies started rifling their barrels about .307 inch, and then discarded their drills and cutters when they were worn so that the barrels came through .3085 inch to .309 inch. These companies also probably make their bullet jackets thin, and their bullet cores of a soft alloy, so that the bullets will expand to fit barrels of any of these various diameters. It is a perfectly practical matter to make a bullet small and of such hardness or softness of core that it will expand to do its best work in a larger barrel. However, we have found that the best results are obtained when we make a bullet with a fairly thick jacket and a hard core, and make it very slightly over groove diameter. At this arsenal we make our bullets hard and stiff, with a diameter of about .3082 inch to do their best work in barrels which measure from .308 to .309. We could, if we so desired, make our bullets to measure .306 inch, and make them softer so as to expand to a large barrel, but we could not get quite such good results. This last method is the old-fashioned method, copied from the British system, and is used by most of the commercial companies in making ammunition for sporting rifles. From this it will appear to you that the small Winchester and Remington bullets, measuring from .306 inch to .3065 inch, should give good results in your Remington .30 automatic rifle. If you use a Government bullet in this rifle, and the groove

Next time try Pyramid Solvent to dissolve smokeless powder residue quickly, easily. If your dealer can't supply you, send us 30c in stamps for handy 3-oz. can. Three-in-One Oil Co., 165-P Broadway, New York

Contains no moisture. May be left in gun.

D472

diameter of the barrel is .307 inch, and the bullet measures .3082 inch, you should get a little bit higher pressure, but I do not think you will get dangerous pressures. Probably the pressures may run about 2,000 pounds over the normal, which would give you no trouble.

I do not believe it is necessary to resize the cases fired in your own rifle for use again in your own rifle, except that of course they should be resized at the muzzle to hold the bullet properly. However, if you use cartridges that have been fired in another rifle, it may be necessary to resize to make them fit correctly in the new chamber.

Reloading tools should be accompanied with a muzzle resizing die and a shell expanding chamber, sometimes only the resizing die is necessary, but in dealing with all makes of cases we often find that it is desirable to have the resizing die rather small to resize the muzzle down pretty well, and then use an expander in the muzzle to expand the neck inside to the correct size to fit the bullet friction tight. A little experience with the cartridge cases you are using will show you whether the expander is necessary or not.

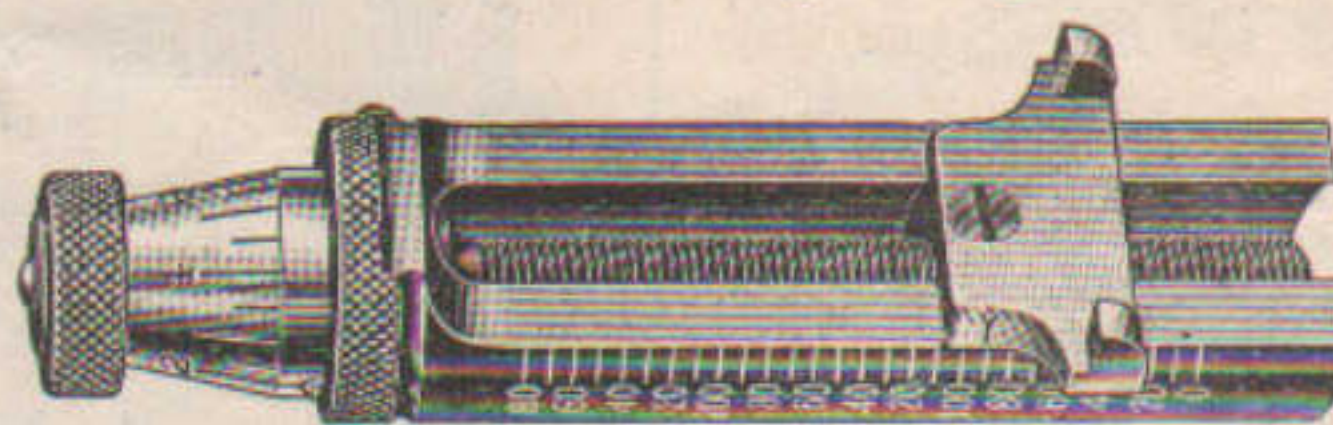
The trouble with the Lyman No. 103 sight on the Springfield is not due to the place on which it is mounted. In ninety-nine cases out of one hundred with the sight mounted on the end of the cocking piece the sight comes to exactly the same place each time when the slack is taken up on the trigger. With bolt action rifles the slack should always be taken up as soon as the rifle is placed to the shoulder and before the aim is started, so that this does not figure in in the alignment of the sights. However, it has been found out that the Lyman No. 103 sight is so designed that it is very difficult indeed to keep lost motion out of the sight itself, unless the sight is made by a skilled toolmaker, which of course is not possible in quantity production. My own sight was made by a toolmaker in the Experimental Department there, being the first sight turned out, and with it I have had no trouble. I understand that the Lyman Company found that they could not keep this sight from working loose in the wind gauge joint under their system of quantity production, and that therefore they have discontinued making the sight. However, they have recently slightly redesigned the sight to obviate this fault and I believe we will see it manufactured again in its new form very shortly. This location is very much better for a hunting sight than the location of the No. 48.

I HAVE a .280 Ross Sporting Rifle with 28-inch barrel, and as I hunt horseback mostly in this country, the barrel being so long makes the gun very awkward to handle from a saddle scabbard.

Please give me your opinion of this gun and if it will be practical for me to have the barrel cut off to 24-inch length. Will it lose very much of its efficiency with barrel of 24-inch length compared to 28-inch barrel?

Who would you suggest that I send the gun to to

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cut off the barrel and reset the front sight after barrel is cut off? Please answer at once.

C. G. M., Dallas, Tex.

Answer: It will not hurt to cut the barrel of the Ross 280 rifle from 28 inches to 24 inches, provided it is well done by a skilled gunsmith. There should be such a gunsmith in Dallas.

You will probably decrease the muzzle velocity about 150 feet per second by this change.

WHAT is your opinion of the .256 Newton as a big game cartridge; also how does it compare with the .30 calibre model of 1906 for accuracy and velocity at 100 yards and at 500 yards?

J. A., Del Rio, Tex.

Answer: The .256 Newton cartridge is perhaps a little better as a game cartridge than the .30 Cal., Model 1906, loaded with the 150-grain bullet at 2,700 f. s. muzzle velocity, but is not nearly as good a game cartridge as the .30 Cal., Model 1906, with the 180-grain bullet, as loaded by practically all the cartridge companies. The Newton cartridge is not quite as accurate as the Model 1906 cartridge.

Mr. Newton publishes a catalogue which gives comparisons in velocities and accuracies at the various ranges between his cartridge and the Springfield cartridge with 150-grain bullet.

I HAVE recently reloaded some W. R. A. '17 Springfield ammunition, the same as was used at Eddy-stone in sighting rifles during war, loaded with 150-

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Jointed Rifle Rod
When screwed together it's as solid as a one-piece rod—cannot wobble, bend or break. 3 brass sections, 2 steel joints, steel swivel at end, 26, 30 and 34 in. long. State length and caliber. \$1.25

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grain bullet and 47 grains of powder; I think Du Pont No. 20, but am not sure.

I have simply removed the 150-grain bullet and substituted the Western Cartridge Co.'s 180-grain open point expanding, Lubaloy bullet, leaving powder charge as it was. Expect to use them next month on the Gaspé Peninsula, Quebec, for moose and caribou.

Have shot several rounds of same through 13 thicknesses of 3/8-inch pine boards tied in a bundle, and 1/2-inch rolled steel. The penetration and expanding qualities are all that could be desired, but am told by one of our local gun cranks that I am hugging the danger line too close.

Will this load produce excessive breach pressure? Am shooting U. S. Springfield Armory, Model 1903, No. 473149, a pre-war model. Thanking you for the information I know you can give me, I am,

F. F. F., Lancaster, Pa.

Answer: The substituting of the 180-grain Western open point expanding bullet in the regular service cartridge, leaving the service powder charge intact, will give rather high pressures, not perhaps absolutely unsafe, but bordering too near the margin of safety to recommend.

I would strongly advise that you pour all the powder out of the cases which you open and then refill them with charges of only 45 grains. A druggist could measure out the charges for you if you have no powder scales.

THESE CLUBS HAVE BEEN ADMITTED TO MEMBERSHIP IN THE NATIONAL RIFLE ASSOCIATION OF AMERICA:

CIVILIAN RIFLE CLUBS

Iowa.

Iowa State College Ex-Service Men's Rifle Club, Ames, Iowa; Secy., R. F. Johnson, 503 Duff Ave., Ames, Iowa; Pres., F. T. Riggs; Vice-Pres., Geo. D. Leask; Treas., C. F. Gregg; Exec. Officer, Don C. Anderson. 71 members.

Michigan

American Legion Rifle Club, Marshall, Michigan; Secy., H. G. Fondra, Marshall, Michigan; Pres., Guy H. Grant; Vice-Pres., J. D. Wright; Treas., A. C. Burgy; Exec. Officer, Ray Merriam. 37 members.

Oklahoma.

Duke Rifle Club, Duke, Oklahoma; Secy., J. F. Stockton, Duke, Oklahoma; Pres., R. H. Mays; Vice-Pres., J. F. Reaves; Treas., D. A. Smith; Exec. Officer, Clarence Bailey. 19 members.

Texas.

Port Arthur Council Rifle Club, Port Arthur, Texas; Secy., George Larson, Texas Co., Port Arthur, Texas; Pres., Gilbert E. Perry; Vice-Pres., Henry T. Pitrey; Treas., M. S. Murchison; Exec. Officer, G. W. Talbot. 29 members.

Maryland.

Western Maryland College Rifle Club, Westminster, Maryland; Secy., B. R. Farrar, Westminster, Maryland; Pres., J. D. Kopp; Vice-Pres., David Hotenstein; Treas., H. W. Ward; Exec. Officer, E. C. Smith. 100 members.

New York.

Devaux School Rifle Club, Niagara Falls, N. Y.; Secy., Charles J. Metz, De Veaux School, Niagara Falls, N. Y.; Pres., W. Shepard; Vice-Pres., R. Titus; Treas., K. Royte; Exec. Officer, H. Allen. 15 members.

The Lake Placid School Rifle Club, White Face Inn, Lake Placid, N. Y.; Secy., E. E. Fairchild, Jr., White Face Inn, Lake Placid, N. Y.; Pres., Roderick Robinson; Vice-Pres., Walter Wood; Treas., Erickson Parkins; Exec. Officer, George Boyce. 29 members.

WANT AND FOR SALE

Each subscriber to ARMS AND THE MAN is entitled when his subscription is paid up for one year, to one free insertion of a half-inch want ad in this column.

All he needs to do is to send in the advertisement for insertion at the same time calling attention to the date when his subscription was paid.

OLD-TIME and modern firearms bought, sold and exchanged. Kentucky flint-lock rifles, old-time pistols, revolvers, guns, swords, powder-horns, etc. Lists free. Stephen Van Rensselaer, 873 Madison Avenue, New York City.

FOR SALE—Westley Richards "Faunetta" 20-gauge ball and shot gun. Rifled at muzzle only. Will make five-inch groups at 100 yards with special copper capped ball ammunition and the usual improved cylinder patterns with $\frac{1}{8}$ ounce of shot in standard 2 $\frac{1}{2}$ -inch paper cases. 28-inch barrels. Weight 6 $\frac{3}{4}$ pounds. Recoil no more noticeable with ball than with shot. Best quality finely engraved; straight grip stock, oil finished. 14 $\frac{1}{8}$ x 2 $\frac{3}{8}$ x 1 $\frac{1}{2}$. Non-automatic top safety. Hammerless. Anson and Deely action ejectors. Gold bead front sight with "turn up" $\frac{1}{8}$ inch white enamel night sight. Flat folding leaves for 75, 150 and 250 yards. New. 80 rounds of ball ammunition, \$400. T. D. Sloan, Chevy Chase, Maryland.

FOR EXCHANGE—4 x 5 Eastman Aeroplane Camera, focal plane, shutter, etc., perfect at about one-fifth of cost; night marching compass; \$20; 6-inch field gun Boesch prismatic telescope sight, \$25; several telescope sights and several thousand dollars' worth of firearms and ammunition, etc., at one-half cost or less. What have you? Hagans, Clifton, Arizona.

FOR SALE—Four Springfield Sporting Stocks, at cost. Pistol grip (one with large hollow forearm, curly walnut, \$55.00), checkered, reformed service butt-plates (one with recoil pad), oil finish, length trigger to butt, 13 $\frac{1}{2}$ inches; drop 2 $\frac{7}{8}$ -inch heel, 1 $\frac{1}{8}$ -inch comb. Shipping charges extra. Send money order to Frank A. Williams, 4627 Seebaldt Ave., Detroit, Mich.

FOR SALE—Remington automatic shotgun with leather case, 12 ga., full choke 28-inch barrel. New condition. Price \$35. Also Colt single-action re-

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volver for 44 S. & W. special cartridge, 7 $\frac{1}{2}$ -inch barrel. New condition; shot less than 300 rounds. Price \$25. W. C. Davidson, 323 E. Market St., Alliance, Ohio.

FOR SALE—My improved checking tools; fine, medium and coarse. Also bordering tools to match for round border. \$1.25 each. \$4.50 for four, \$7.25 for six. G. R. Martin, 412 Park St., Sheridan, Wyo.

FOR SALE—Sporting Springfield, perfect condition, made from National Match rifle, No. 48 rear and ivory bead front sights, fine hand-made pistol grip stock, checked, \$75. Reising .22 auto pistol and holster, brand new, \$25. First money order for either or both. R. S. Tichenor, Princeton, Ind.

FOR SALE—100 Western 180 gr. expanding .30 cal. bullets; 1 lb. Du Pont No. 16 powder; 1 Ideal reloading tool and shell resizer for .30, '06, 1600 Frankford shells, new condition, \$18 for the lot. Also unopened case service ammunition, \$50; and French, 8 mm, Lebel ammunition, \$5 per hundred. W. Keith Rider, 217 N. Robert Blvd., Dayton, Ohio.

FOR SALE—Luger 7.65 mm. pistols, 8-in., 12-in., 16-in. barrels and holster stock extra. Mauser pistols, 7.63 mm., with wooden holster-stocks. Mauser sporting rifles, .30-'06 U. S. Gov. The world's best. Pacific Sales, Ltd., Moscow, Idaho.

FOR SALE—One new B. S. A., caliber .22, air rifle. Perfect condition. \$30, or will exchange for new and perfect Springfield, Model 1903. H. D. Dodge, Care Gray Tractor Co., Inc., 30th and Univ. Aves., S. E., Minneapolis, Minn.

FOR SALE—Imported Italian prism binoculars, 8X, with case and straps, price \$30. John F. Springer, 813 Commerce St., Wellsville, Ohio.

FOR SALE—Two 7-mm. Remington rolling block military rifles, 30-inch barrel, new, \$18. J. W. Beeler, 320 No. 12th St., St. Louis, Mo.

FOR SALE—Winchester single shot, 45-70, action good, \$8. Remington pistol, 32-20, good second-hand condition, \$12. I want to buy old guns, catalogues and gun books. Fred Wainwright, Grayling, Mich.

FOR SALE—One new, star-gauged, Springfield rifle, caliber .30, model 1903, chambered for model 1906 ammunition, fired about fifty times, extremely accurate; price \$30. One new Stevens "Lord model" target pistol, 10-in. blued barrel for .22 long rifle rim-fire cartridge. One of the most accurate pistols made and is beautifully finished. Price \$15. One Smith & Wesson revolver, blued steel, 6-in. barrel, chambered for .38 short and long Colt, frame and barrel show slight wear. Inside of cylinder and barrel perfect. Very accurate. Price \$15. J. A. Van Wie, 251 River St., Troy, N. Y.

WANTED—Heavy 8-gauge, double gun; full choked; hammer or hammerless; for experimental purposes. Box 215, Clay City, Ill.

PISTOL, REVOLVER, RIFLE and shotgun stocks made to order, any shape, length or drop, plain or fancy wood. All strictly hand made. Prices \$5 and up. Theodore M. Carlson, Kellettsville, Pa.

EXCHANGE—100,000 rounds modern ammunition. By box, below wholesale; in quantities, as low as one-half of wholesale. Old time from 24 cents per box up. 10-ga. leaders, 90 cents box; in quantities, 63 cents. .32 short and long, 24 cents to 85 cents. .22 C. F. in quantities, 51 cents. .32 Sp. Win., 63 cents, 6 mm., .33, 30/40 at 72 cents per box, etc., etc. Dozens of other calibers of Win., Rem. Also guns accordingly. Hagans, Clifton, Ariz.

FOR SALE—One .22-caliber Stevens rifle, model 414, in perfect condition, \$15. Send check or money order payable to James E. Givan, 410 Maryland Trust Building, Baltimore, Md.

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EXCHANGE—Will exchange one brand new Colt new Service .45 for Colt or S. & W. .44-40 in good order. H. Roedder, 702 P. S. C., Davenport, Iowa.

EXCHANGE—Colt's D. A. .45, fine condition. Want Winchester 5-A telescope A. Lee Chamberlin, Roosevelt Apt. 20, Davenport, Iowa.

FOR SALE—Schutzen Ballard, .33 cal., Pope barrel, muzzle bullet starter and rod, triple mould and lubricator, beautiful curled walnut stock. \$50. Schutzen Ballard, Peterson barrel, .32-40, \$40, or will trade either rifle for 20 or 16-gauge shotgun of equal value. Remington target pistol, .44 cal., S. & W. Russian, patridge sights, \$40. S. & W. Russian revolver, .44 cal., patridge sights, like new, \$50. S. & W. .22 cal. target pistol, 10-inch barrel, patridge sights, \$20. Colts .22 cal. auto pistol, \$25. All in perfect gun-erank condition. Any sent on receipt of \$5. bal. C. O. D., with privilege of examination. Three unopened boxes Peters .44 Russian cartridges, 200 hand-loaded and about 300 empties, \$10. Ideal loading tool, 44 Russian and W. C. F., two bullet moulds, \$5. Dr. C. Edw. Sayre, 6438 Drexel Ave., Chicago, Ill.

WANTED—Copies of Arms and The Man, printed 1917-1918 of the old-time rifle and pistol shooters; those copies only. Edgar E. Hamilton, Butler Hospital, 305, Providence, R. I.

FOR SALE—.45 A. C. P. Colt New Service, new factory barrel and cylinder, \$25. Remington-Lee, remodeled, bolt action, box magazine, 45-70, \$10. Krag sporter, perfect condition, carbine length barrel, \$22 for quick sale. Empty 30-06 shells, 1c each. WANTED—Two Winchester .22 rifles in good condition. Send postal money order or certified check. P. B. Sharpe, 6 Gray Street, Portland, Maine.

FOR EXCHANGE—One .33 cal. Winchester rifle, bluing slightly worn, barrel, etc., perfect, for a pair of high powered binoculars or a portable telescope. DeWitt C. Kellinger, 338 East 35th Street, New York City.

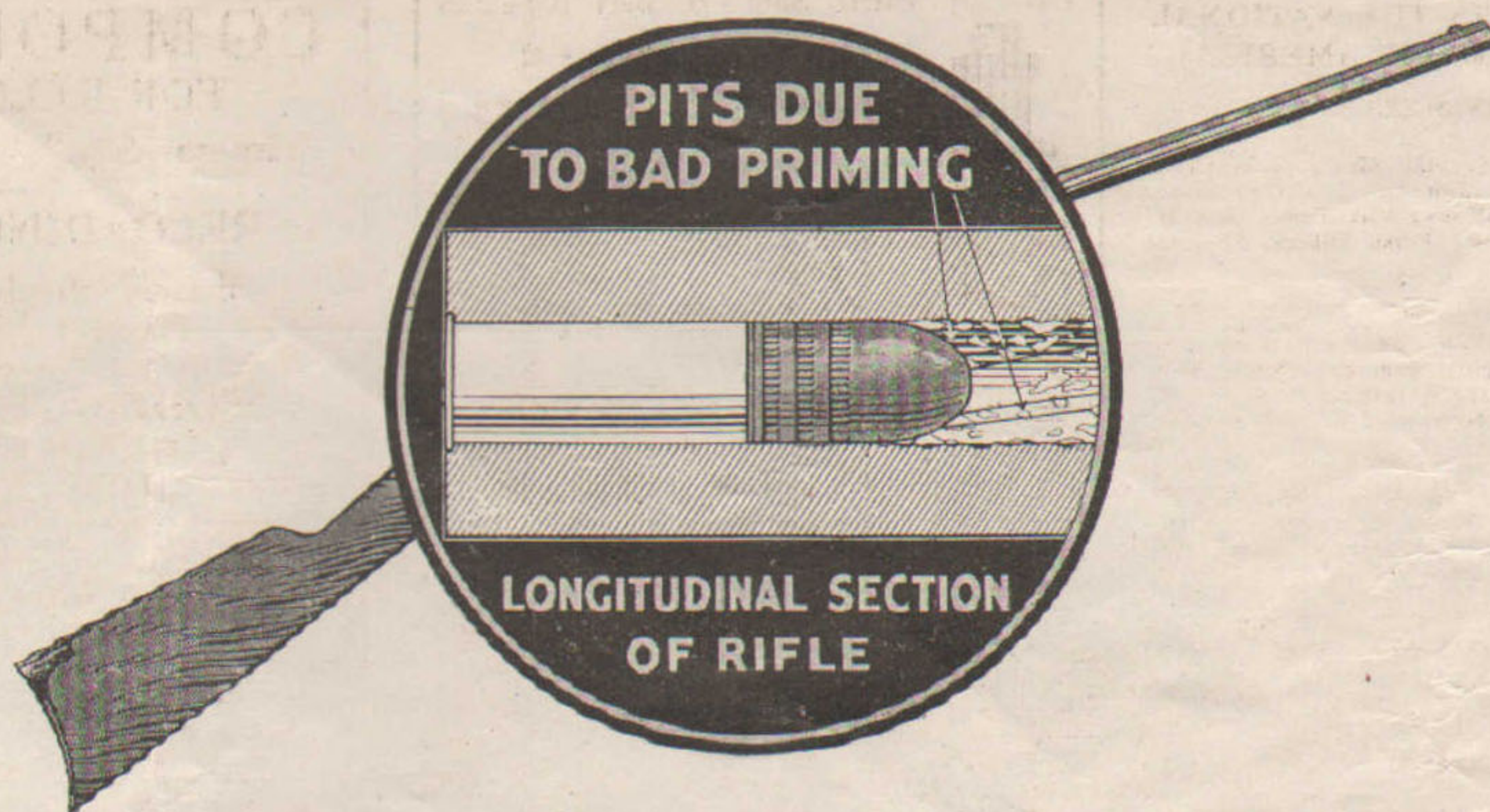
FOR SALE—.30 cal. Mauser automatic complete with stock holster, \$40.00. 9 mm Luger 4-in. barrel, leather holster and extra clip, \$35.00. Springfield rifle and 180 rounds ammunition, \$30.00. All are in excellent condition. Snyder Hall, M. I. T. Dormitories, Cambridge, Mass.

FOR SALE—Two specially made Winch., single shot, rifles: 30-40 Krag and 28 cal. (Krag shell-necked down), \$60.00 each. Write for photos and description. S. E. Duskin, 1143 W. 69th St., Los Angeles, California.

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FOR SALE—Aluminum butt-plates for Springfield increasing length of stock $\frac{5}{8}$ inch, \$1.50, or fitted with your trap, \$3. Checked steel shotgun butt-plates, man sized, \$3. Bronze pistol grip caps, \$1. Also all these articles, and sight bases, barrel bands, and sling swivels made just as you wish, and engraved as you wish at special prices. Let us make the fittings for your pet sporter to express your own individuality. Whelen telescope holders best on market, \$1.50. Howe and Kessler, 3203 Benner St., Frankford, Philadelphia, Pa.



Don't Send Your Barrel to the Scrap Heap

Shooting ordinary cartridges thru an accurate barrel is almost as disastrous as leaving it out in the rain.

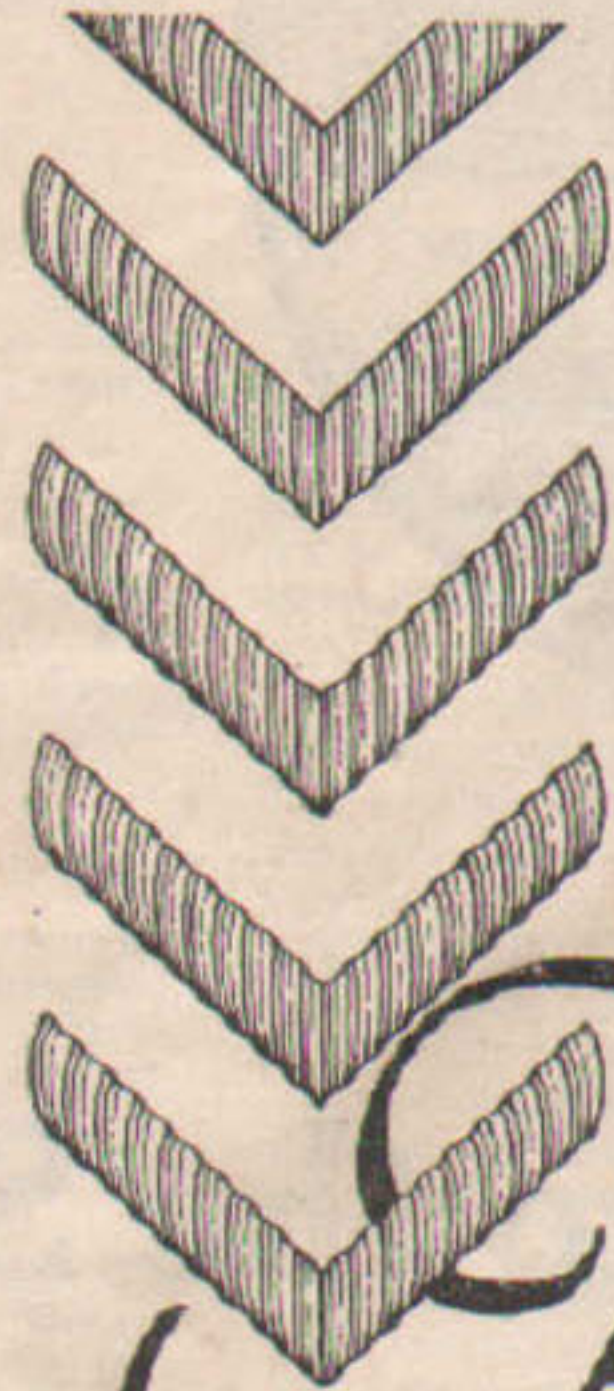
The chemical action of old-type priming causes the barrel to rust and pit, thus destroying its accuracy.

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