

THE AMERICAN RIFLEMAN'S MAGAZINE

ARMS AND THE MAN

RIFLE
SHOOTING
AMERICA

VOL. LXX. No. 17

MAY 15, 1923



100% PETERS

Sheridan, Wyo., Rifle Team finds in Tack-Hole a cartridge that gives results totally in keeping with its ability.

In the N. R. A. Gallery Matches just completed, the members of the above Team made a showing that reflects great credit upon their ability as marksmen:

Match 6—50 ft. Team kneeling, won 1st place, 1464 x 1500
Match 8—50 ft. Team Prone, won 1st place, 1496 x 1500
Match 14—50 ft. Civilian Inter-Club, won 1st place, 3934 x 4000
Match 20—50 ft. Individual Standing, Palmer, 1st, 400—539 in shoot-off

Match 22—50 ft. Individual Kneeling, Ladd, 2d, 400—19 in shoot-off
Logsden, 1st, 399 x 400
Palmer, 2d, 397 x 400
Spencer, 3d, 396 x 400

A good marksman with inferior ammunition is lost entirely, but a good marksman with Tack-Hole ammunition is a combination that takes a better marksman with Tack-Hole ammunition to defeat.

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[Chambered for 22 Short and 22 Long Rifle Rim Fire]

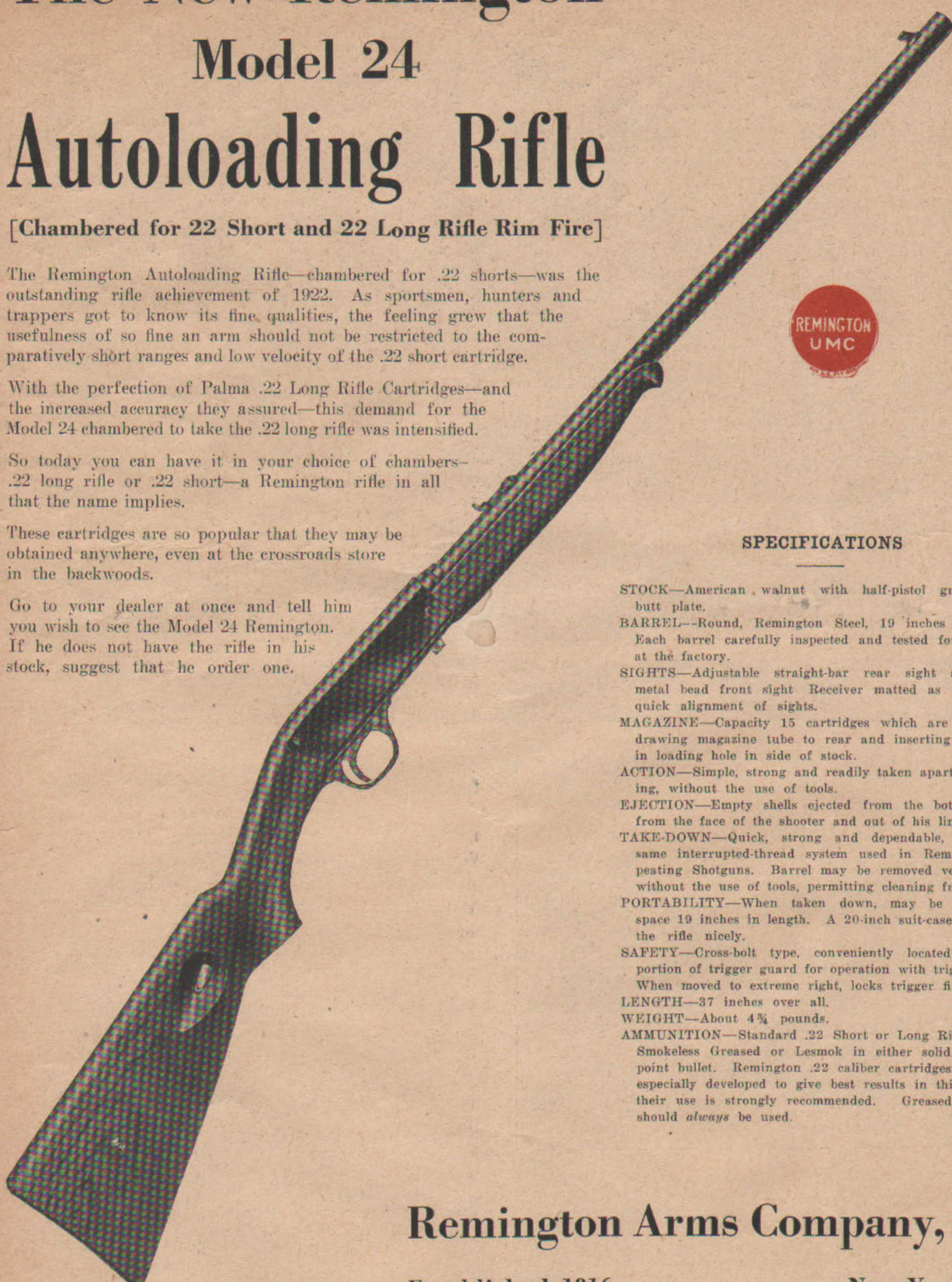
The Remington Autoloading Rifle—chambered for .22 shorts—was the outstanding rifle achievement of 1922. As sportsmen, hunters and trappers got to know its fine qualities, the feeling grew that the usefulness of so fine an arm should not be restricted to the comparatively short ranges and low velocity of the .22 short cartridge.

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These cartridges are so popular that they may be obtained anywhere, even at the crossroads store in the backwoods.

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SPECIFICATIONS

- STOCK**—American walnut with half-pistol grip. Steel butt plate.
- BARREL**—Round, Remington Steel, 19 inches in length. Each barrel carefully inspected and tested for accuracy at the factory.
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- PORTABILITY**—When taken down, may be packed in space 19 inches in length. A 20-inch suit-case will carry the rifle nicely.
- SAFETY**—Cross-bolt type, conveniently located in front portion of trigger guard for operation with trigger finger. When moved to extreme right, locks trigger firmly.
- LENGTH**—37 inches over all.
- WEIGHT**—About 4¾ pounds.
- AMMUNITION**—Standard .22 Short or Long Rifle rim fire Smokeless Greased or Lesmok in either solid or hollow point bullet. Remington .22 caliber cartridges have been especially developed to give best results in this rifle and their use is strongly recommended. Greased cartridges should *always* be used.

Remington Arms Company, Inc.

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New York City

THE AUTHORITY IN FIREARMS, AMMUNITION AND CUTLERY

ARMS AND



SHOOTING AND FISHING

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You Never Can Tell Till You Tryout

By Lieut.-Comdr. E. E. Wilson
Adjutant, International Team, 1922

ONE of the things that most impressed the members of last year's International Team was the fact that there were about seven times as many Swiss shooters at Milan as there were Americans at the Quantico tryouts. Nearly everybody has said something about this in ARMS AND THE MAN, and has put forward some suggestion for its remedy. Most of these are predicated on the supposition that there aren't two hundred top notch shooters in this country and that something will have to be done about it. Personally, I have a sneaking hunch that, buried somewhere in the wilds of America there are a couple of thousand such shooters who don't even know their own calibre. The important thing to do is to break them out and get them on the job.

In the search for these potential shooting nuts it is necessary that we know first just what it is that makes a championship rifleman. Last year Walter Stokes compounded a questionnaire which went into minute detail in so far as the shooting members of the 1922 team were concerned. From this he drew certain conclusions, but for the most part there was nothing conclusive about the dope at all. For instance, one good shooter may have grasped the small of the stock with the thumb and forefinger of the right hand, while the other solemnly carried the foot six inches to the rear and three inches to the right! The average age of the team was found to be that at which experience begins to be overcome

by failing eyesight and physical debility, yet Old Cy Osburn, the Navy War Horse, swapped shots with the youthful Walter in a way calculated to cast doubt upon the conclusion.

We all remember the great shots of fiction, Davy Crocket, Daniel Boone and Wilhelm Tell. Their skill was ascribed entirely to their eagle eyes and steady nerves. This was exemplified on the Navy Team which won the National Match in 1909. "Chink" Lee, who took the Military Championship and the National Pistol Match in 1907, was so blind he couldn't read an eye card at six feet and only got by his physical exams at Annapolis by memorizing the cards. Denny, his shooting partner, who used to nick a 47 on the old 8-inch bull's-eye of the A target with regularity, trembled so violently in the off hand position that his team mates feared he would shake off his sight cover. By all the laws of fiction, these two should have been ruled off the team automatically, but somehow they managed to struggle along and win matches right and left.

Last year at Quantico, Capt. "Hal" Leizear, of Washington, D. C., was one of the bright stars. He was an international shooter when most of the rest of us were exercising with the bean blower. He used to shoot right-handed, but when his eye went bad he shifted over to the port side. While the rest of us were chipping, filing and scraping to put the finishing touches on our high-priced, fancy, special gear:

palm-rests, set-triggers, aperture-sights, butt-prongs and other hyphenated contraptions, he took a regulation Springfield off the shelf and drifted out to the firing line. Some of us were so careful of our health that we knocked off coffee and cigarettes to preserve it. Mr. Leizear had such poor health that he had been advised by his physician to take a rest. That is what he was doing down at Quantico, and when he had finished resting only twelve of the experts were ahead of him!

It is not the intention to decry the importance of physical fitness or proper equipment. It is the purpose, however, to emphasize the fact that there is another most important factor in this game—a factor so important that it is able to overcome all handicaps to the point even of making a champion. This is nothing more nor less than the power of the will. First, last and always, this is the heart and soul of shooting or any other sport. It is the will that directs the shot, that controls its accuracy. It is the will that carries the shooter through tight competitions and on to victory.

Imagine a shooter on the firing line in the offhand position. Even the steadiest holder cannot keep continuously on. When he is on he starts to squeeze the trigger; as he slides off he stops the squeeze, but holds all he has; back on again he continues to exert the pressure until, finally, the gun goes off without his having known the precise instant it was to fire. Now all during this process his every faculty must be concentrated on his aim. He must be totally oblivious of his surroundings. He must almost will the sights on! He will be tempted many times to yank the trigger and trust to luck that the shot will drop in. The sad part is that luck doesn't work that way; it follows the inexorable law of averages. The shooter then finds himself engaged in constant combat; on one side is the sore temptation to obey that impulse and let her go; on the other the will to hold and hold and not let go until the front sight rings the bull's-eye in a "perfect pull."

This, in brief, is the influence of will on firing technic, but it is even more important in the mental attitude toward competition. Nearly every one is bothered somewhat by competitive firing. Most people don't do so well in a big tight match as they do in practice. The worry a man has for fear he won't measure up, occupies so much of his thought that he fails to concentrate on the job in hand. This is where long practice comes in. Practice and experience beget confidence. A certain amount of conceit is absolutely necessary. The reason why Walter Stokes is twice champion of the world is because he not only measures up to the test but he always does better in competition than at any other time. The most important single thing in competitive firing is the everlasting *will to win*.

It was almost ludicrous last year at Quantico to watch the first relay up—it would have been ludicrous if it hadn't been so tragic. All summer long the entrants had trained and worked for this moment. The prize was a membership on a team representing the whole United States and a trip abroad to boot. The air was electric. Shooters fidgeted nervously in those little canvas booths waiting for the bugle. They were as self-conscious as a prima donna on her first night. Some fumbled with guns and gear; others drew long and

hard at cigarettes. On the back of every neck and reaching far up into the hair was the tell-tale flush of excitement. Suddenly the bugle blew and the match was on. Down in the pits the discs began bobbing up and down to mark the shots. The results were ludicrous. Everything from tens to swabos were indicated. Every man on the line was affected somewhat. They may not all have had the "bucks," but plenty of them did. And right there the story was told. The real shooters snapped out of it and settled down to win, while the others continued to "buck" and to trail.

Now the point of all this is that there are thousands of good shooters in this country who have never entered such a try-out. Perhaps they think there is little chance to replace any of the old-timers. As a matter of fact, however, there is every chance in the world. At Milan no less than eighty points separated the top man from the bottom one on the American team. On the Swiss pistol team which won its match, not over seven or eight points separated the members at the end. Here, then, is a fine chance for the newcomer. He may not make the grade the first time, but he can push the bird that does make it farther up the ladder—and next year, well, next year the Olympic games are to be held in Paris, and it's none too early to start to win that trip.

The question that presents itself to the newcomer is, how to get ready. In the April 15th number of this magazine, Major Waller pointed the way. The foundation of it is the small-bore game. If a man had two guns, one of them a twenty-two and the other a thirty and if these were very similar in rigging, weight, balance, etc., and if a man went about it to train conscientiously under the international match conditions, he could, in the next few months, make wonderful progress. There would be a lot of interesting experiments in tinkering to get the free rifle gear to suit. This could be tried on the small bore and adapted to the thirty when it has been proven right. A man would want to keep a record of his strings, plotting curves of his scores to show progress and compare results. And then when all is ready, a little practice with the big gun to get elevations and adjustments, and the newcomer is ready to cross guns with the champions.

This year there will be sectional tryouts, the winners of which will compete in the finals at Camp Perry. All hands will be on the job; foxy old-timers with lots of experience; gun-nuts de luxe with fancy gear; nervous newcomers with lots of determination—and these are the boys we want to see. Some of them will have qualms about invading the field of the old timers; most of them will wonder what chance they have with these boys. Well, the truth of the matter is that these people are human. They yank a five now and then like anyone else. But where they win is on the old fighting spirit—the *will to win!* the everlasting self-control that won't let one go until it is good—the ability to put forth the supreme effort in close competition. Certainly there must be more than a handful of such shooters in these United States. Maybe you're one of them yourself; maybe you doubt it. There is only one way to determine the fact. You never can tell till you tryout!

High Velocity Game Bullets

By Bryon E. Cottrell

SPEAKING of high-speed bullets and their quite frequent failure to produce a clean kill on big game, I have made some experiments which might be of interest. These experiments were made with a 250-3000 Savage bolt-action rifle. I could sight dozens of instances where this cartridge, with standard load has failed, but you are all familiar with them.

It goes without saying that a bullet that will blow up on impact will not give proper penetration. So I began experimenting to find out just what bullets would blow up and what ones would not.

I did the shooting into hard packed snow drifts at a distance of about 100 paces. A low-power bullet when shot into a snow drift will not be harmed in the least, even when measured with a micrometer it will be found about as it was when it left the barrel, but at a speed of around 2000 f. s. they will begin to mushroom a bit, and a regular 87-grain S. P. bullet at 3000 f. s. will go to atoms, so to speak. I do not think a snow drift offers as much resistance to a bullet as soft meat. Therefore, a bullet that will not hold together in a snow drift should not in my opinion be used on any game where deep penetration is needed.

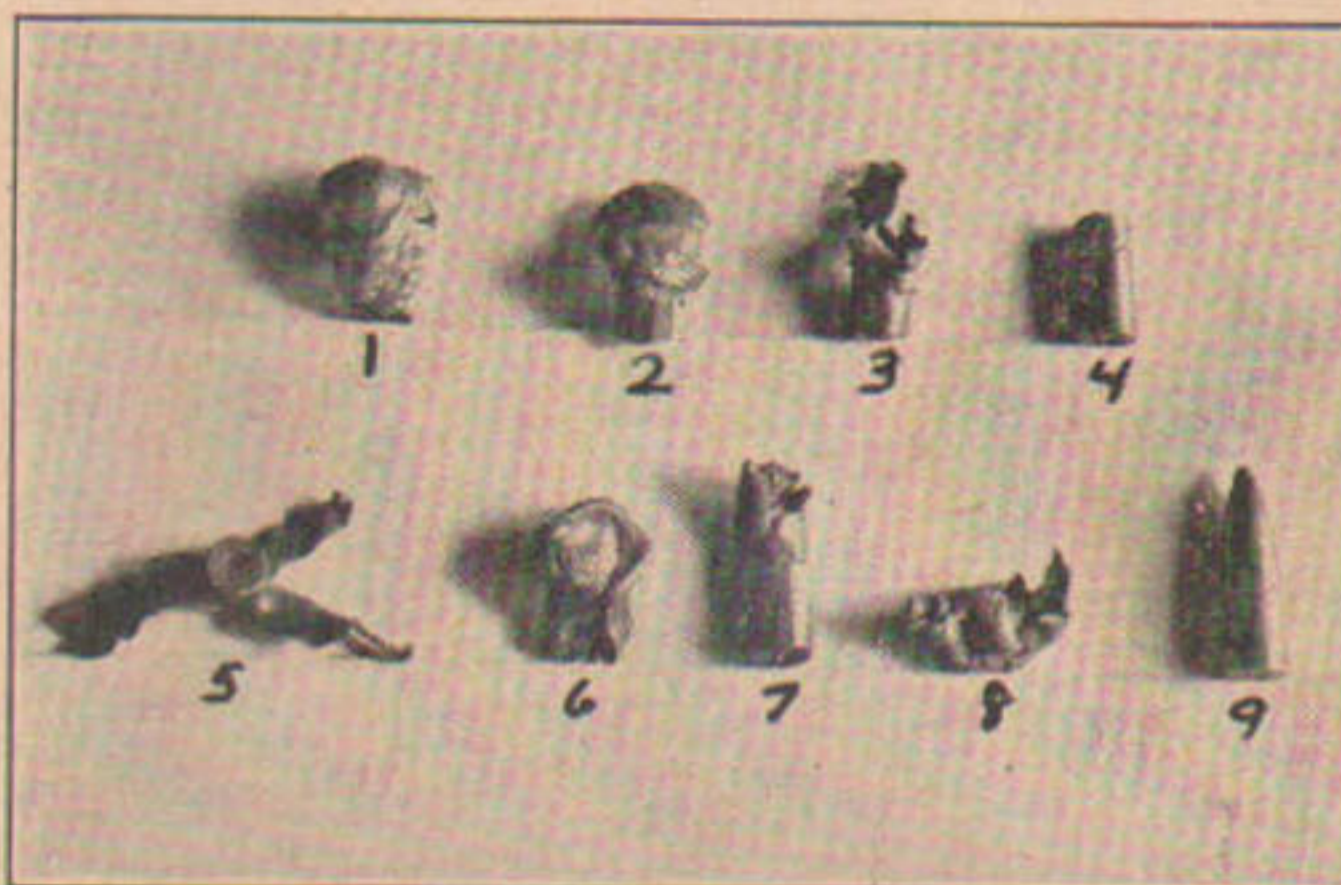
I first used a Lubaloy 25-20 (86-grain) S. P. bullet. At approximately 1900 f. s. (18-grain du Pont No. 80 used) it would just nicely flatten the point. When used with 30-grain du Pont No. 16, which likely gives about 2500 f. s., it would mushroom nearly its whole length, but would not blow up. When I tried 34-grain No. 16 the bullet went to pieces, and I could not find a piece of the jacket as large as a pin head, and the lead would be smaller yet.

The next summer I used mostly the Western 100-grain Open Point bullet with 36-grain du Pont No. 16 for woodchucks, etc., and liked it better than I did the 87-grain. That fall (last) I used this same load for deer and bear hunting, but did not get a shot. My pard shot a buck with a 150-grain .30 caliber bullet at 2700 f. s., and the bullet went to pieces without hitting a bone. Then I began to have some misgivings about my 100-grain bullet at around 2,900 f. s.

So this winter as soon as we had the proper snowdrifts I began experimenting, and I found out that 100-grain bullets would blow up just exactly as the 87-grain. I was disappointed, as I liked that bullet. I reduced the powder charge to 33 grains, but even at this those bullets would go to pieces. The biggest piece found was the jacket base.

Then I sent for some 117-grain 25-35 S. P. bullets. I have used these some time before and found that the 33-grain charge of No. 16 recommended by the du Pont Company as giving 2,600 f. s. velocity, gave just a bit more pressures than I liked. Although when used in new cases with brass primers they

gave no trouble. I reduced the load to 32 grains and guessed that I got about 2500 f. s. The way this bullet would hold together was sure pleasant to see. They all mushroomed fine, and none blew up entirely. Here is what some of the bullets weighed in grains after firing: 91, 103.5, 92, 46, this last is the lightest one I got, and even this is some different from having them all go to



Numbers 1, 2 and 3 are 25-35, 117 gr. bullets after being shot into snowdrift. They weigh respectively 92, 103.5, 46 gr. No. 4 is a 25-20 S. P. Lubaloy after being shot into drift at 1900 f. s. Notice the lead point is gone and front of jacket is opened up just a trifle. Nos. 5, 6, 7, 8 and 9 are all Western Tool & Copper Works standard 250-3000 bullets. Nos. 5, 6, 7 were shot into snowdrifts and weigh respectively 29 gr. (just the jacket), 48 gr., and 86.5 gr. No. 8 is the one that went through the hemlock knot, calves shoulders, and stopped in the plank; it is just the jacket and weighs 35 gr. No. 9 is one of the bullets before firing.

pieces. At 100 yards the accuracy was good enough for big game in the woods. The shots could be kept in a 6-inch circle. This bullet has a tendency to keyhole, some of the holes showing that they were staggering around quite a bit. However I have hit quite a few woodchucks with this load at from 150 to 200 paces, and it proved to be a good killer.

I had about decided to use this bullet on my next deer hunt when I noticed an advertisement in *Outdoor Life* of the Western Tool & Copper Works of California, advertising an improved high-speed bullet. I sent for a 100. Could get only the 87 gr. weight. I loaded up a few to standard velocity and turned them loose at the snow bank. To my surprise the first one I found was nearly whole, only the point being mushroomed. After several trials not one blew up. I just weighed four after firing and they weigh 79, 86.5, 48, 29 grains. This was the first expanding bullet I had ever used that would hold together at a speed of over 2,500 f. s. And this one at 3,000 f. s. was beating the 117 gr. at 2,500 f. s. I'll say I was pleased.

I have tried both these and the 87 gr. S. P., as made by the Savage and Western Cartridge Co. on calves. I live in a dairy section and often milk is worth more to sell than to feed young calves to make veals, so the calves are killed or sold for their skins when a day or two old. The skin and meat are, of course, tender. They would likely compare well with a small yearling deer. Last year I shot several broadside, hitting them just back of the shoulder with Savage and Western Lubaloy 87 gr. bullets, and not one went through and only one came

through to the skin on the opposite side, so it was found when skinning. It is only fair to say the calves were killed instantly. The force of the blow would sometimes nearly pick them off their feet.

Just today I had the opportunity to try one of the Western Tool & Copper Works' bullets on a young calf. I shot from a position above and about 30 yards distant (same distance I had generally shot). The calf stood quaring facing me; I shot it just back of the shoulder. The bullet came through low down, just in front of the opposite hind leg. It also hit the leg, making a big wound, as it did where it came out of the body.

After the calf was skinned I hung it up and put a one-inch hemlock board up in front of it, and a two-inch plank behind it, and shot so that the bullet would go through the shoulders. The first bullet opened very little in going through the inch board; went through the shoulder, making a big hole; covered the plank with ground bone and meat, and went through the plank. The next shot hit a knot in the board (some of you may know what a hemlock knot is), so it was making about a three-quarter-inch hole when it hit the meat. This bullet also went through, but stopped in the plank. I got it out and cleaned it up. It had mushroomed fine and weighed 35 grains.

I believe a full description of the W. T. & C. W. bullet would prove of interest, as it surely is the best high-speed bullet I have yet used. The ones I have weigh from 87.5 to 88 gr., have a nice shaped spitzer point, are of an even diameter (.2565") and .872" long. They have a very short exposed lead point protected by a copper tip. The jacket is copper and very thick. From the looks I should say they are made from copper tubing. The bases are formed by crimping, something like a shot shell, only it is rolled over in more and then swaged flat, thus practically closing the base. This makes the "solidest" base I ever saw. So much of the bullet is made up of copper that in order to get the correct weight it is longer than the common 87 gr. bullets. For comparison the Western Lubaloy 100 gr. open point bullet is only .879" long. Being of such solid construction the accuracy is fine. It seems to give slightly increased pressures. This is likely due to longer bearing in barrel, and possibly to heavier patch. Superiority of bullet evidently lies in its rigid construction.

From the above experiments I would say that when using our common S. P. bullet the most effective load for big game in any rifle at ranges from 50 to 150 yards is the heaviest bullet that the rifle will handle at a speed of not over 2,500 f. s. nor much under 2,300 f. s. if you want the bullet to open up well when it hits a soft spot. For long range a higher velocity is all right as the bullet slows up before getting to the game.

The 250-3000 Savage bolt action is a fine little rifle and when it fails on game smaller than elk it is not the fault of the gun but the bullet. Let's hope for better bullets. The Western Tool & Copper Works has shown us they can be made.

Ballistic Jurisprudence

By R. E. Herrick

I WONDER how many of our readers have given a thought to whether their knowledge of rifles and pistols might ever be put to practical use in an effort to introduce some erring member of society to a social gathering, commonly known in the past in this part of the country as a "neck-tie party," or vice versa, to save some innocent party from such a fate.

The American Bar Association, I believe it was, that went on record to the effect that 90 per cent of the crime committed in this country was through the means of firearms. Not having any statistics at hand on the subject I am unable to confirm or deny this assertion, but if it is true, or even half true, then there is a large field for some of our recognized experts in this line of endeavor.

Just a little over one year ago in the "wee sma'" hours of the morning the writer was suddenly awakened from a sound slumber to admit one of the members of a firm of lawyers of this city, one of whom is a former U. S. Senator. This firm, it seems was on the defense side in a case where the defendant was accused of shooting a man in a drunken row in a boot-leg cellar. Defendant had signed a confession of guilt, which he later repudiated, stating on the witness stand that he thought another supposed eye witness would try and throw the blame on him and that if he confessed he would get off easier. He admitted on the stand that he had worn his revolver, a 44-40 Colt, to town, but that he hid the gun in the manger of the stable where he left his saddle horse. After taking care of his horse he proceeded to hunt up some pals and get gloriously drunk.

The deceased, a pool hall proprietor, and a friend of the accused, had quarreled over some trivial matter but had been separated by companions. Later they met in the cellar referred to and again took up the quarrel, which this time came to actual rough-and-tumble fighting. Only four men were present in the cellar. The man who was later killed had the defendant's friend down and was getting decidedly the better of the scrap when a shot was fired by some one, and after the smoke cleared away one man was down to stay, the others beating a hasty retreat.

The bullet had gone through the dead man from side to side; there were no powder burns on the deceased man's coat or body, which would preclude any possibility of self-infliction or that the man with whom he had been fighting could have done it. This leaves but the two possibilities, as there were but four men present, as stated above. Of the two remaining men one was a man about 60 years of age, and bearing a very good reputation and who was not a "gun-toter." The last hope was the defendant, and it was this man that the prosecuting attorney proceeded to work upon.

He was arrested and taken to the local

jail and put through the usual third degree methods for nearly one whole night. Among other things tried on him, as was brought out in the evidence, the prosecuting attorney kept a flash-light playing in his eyes. At last, tired out from the strain and no doubt weak and sick from his "jag," he confessed that he had shot to save his friend, who was getting badly worsted. Surely things appeared dark for our defendant, but stay, the hero approaches, or rather a small army of heroes in the shape of good American dollars.

Someone said in one of our comics lately: "You can't send a man to jail because he hasn't any money," and the reply was, "No, and still less chance these days if he has money," and of such is our tale.

The accused secured the best legal talent that could be found, and the prosecuting attorney bestirred himself to make his case as nearly impregnable as he could humanly hope to do, coupled with the written and signed confession of his prisoner, which confession alone would ordinarily spell a short, quick trial with but one almost certain sequel.

So to bolster his case Mr. Prosecuting Attorney employed the services of an expert (self styled) on firearms and ammunition. This man is an operative of a large, well-known detective agency. I quote from the report of the trial as published in one of the dailies:

"Another feature of the testimony taken Thursday was the information supplied by Mr. J. S. G., of Pocatello, an expert on firearms and ammunition. He was called by the prosecution to give expert testimony as to whether or not the bullets found on the floor of the cellar where the shooting had occurred had been fired from the revolvers held in evidence against the accused. A greater part of the day was taken up with his testimony, which consisted of careful measurements of the bullets with a micrometer."

"Late Wednesday night the defense heard of the intention of the prosecution to place an expert on firearms on the stand and immediately secured the service of R. E. Herrick, of Boise, president of the Boise Rifle Club. Mr. Herrick followed Mr. S— on the stand and contradicted a greater part of the latter's testimony, but admitting some.

* * *

"A gasp went over the audience when it was brought out in the testimony that Mr. S— was receiving \$50 a day and expenses for testifying in the case."

Here then is our stage and *dramatis personae*.

As the trial was being held in Oregon the writer was unable to reach the scene until afternoon of the day the expert was called to testify, and for that reason was too late to hear a part of his testimony. It was brought out in cross-examination of this expert however, that he had secured a certain bullet found on the floor of the cellar, and

another one from the inside lining of the coat worn by the deceased at the time of the killing. He had secured the revolver belonging to the accused and had recovered several bullets fired from this gun and by means of a magnifying glass and a so-called "micrometer" had determined that the bullet found in the deceased man's coat had been fired from the gun admittedly belonging to the accused.

One of his tests had been to cut off the jacket of the bullet (a 44-40 soft point) to note the effect of the lands of the barrel on the soft lead beneath. Just what he expected to find there I can not imagine. Perhaps he expected to find some sort of magic photograph showing the image of the \$50 per day he was getting for his "expert" testimony. I suspect it was merely hocus pocus.

His magnifying glass used for comparing indentations on the recovered bullets, was, as I remember, either a single or double lens pocket magnifier. His micrometer caliper was nothing more or less than a Starrett inside and outside caliper rule, graduated down to 1/64". And on the readings of such instruments as these this "Expert" on firearms and ammunition was willing to swear a man's life away at the rate of \$50 per day.

I would like to hear the roar that would go up if the Frankford Arsenal sent out their National Match Springfields accompanied by star gauge records reading something like this: 19.5/64", 19/64", 19/64", and so on. If the particularly rabid N. R. A. individuals of my own ken should receive such a star-gauge card the editors of this magazine would be supplied with enough material on one subject within two weeks' time to last until one certain section of Lake Erie was filled up with bullets.

One amusing incident occurred during cross-examination of the "expert" by the defense. Witness was asked to show the jury the instrument used to measure these bullets. Witness passed over said caliper. The questioner took it, examined it a moment, held it up and exclaimed, "Why this is not a micrometer, this is a monkey-wrench," much to the amusement of the spectators.

Major Hatcher would do well to get this "Expert" on his staff at Frankford Arsenal, for see how complete is his knowledge of the manufacture of firearms:

Question by defense attorney: "Mr. G., have you ever spent any time in a factory where revolvers are made?"

Answer: "Yes, sir. I have been through Browning Bros. plant."

Question: "Explain to the jury how revolver barrels are made."

Answer: "They are cast in moulds."

Shades of Samuel Colt and of Eliphet Remington! Such "expert" testimony in a trial wherein twelve good men and true are to decide whether a fellow man is not guilty of the crime of murder. If that sort of testimony is worth \$50 per day then a hod-carrier who knows his business should receive remuneration at a rate of not less than \$5,000 per day.

(Continued on page 14)

A Real Knife for the Outdoors Man

By Major Townsend Whelen

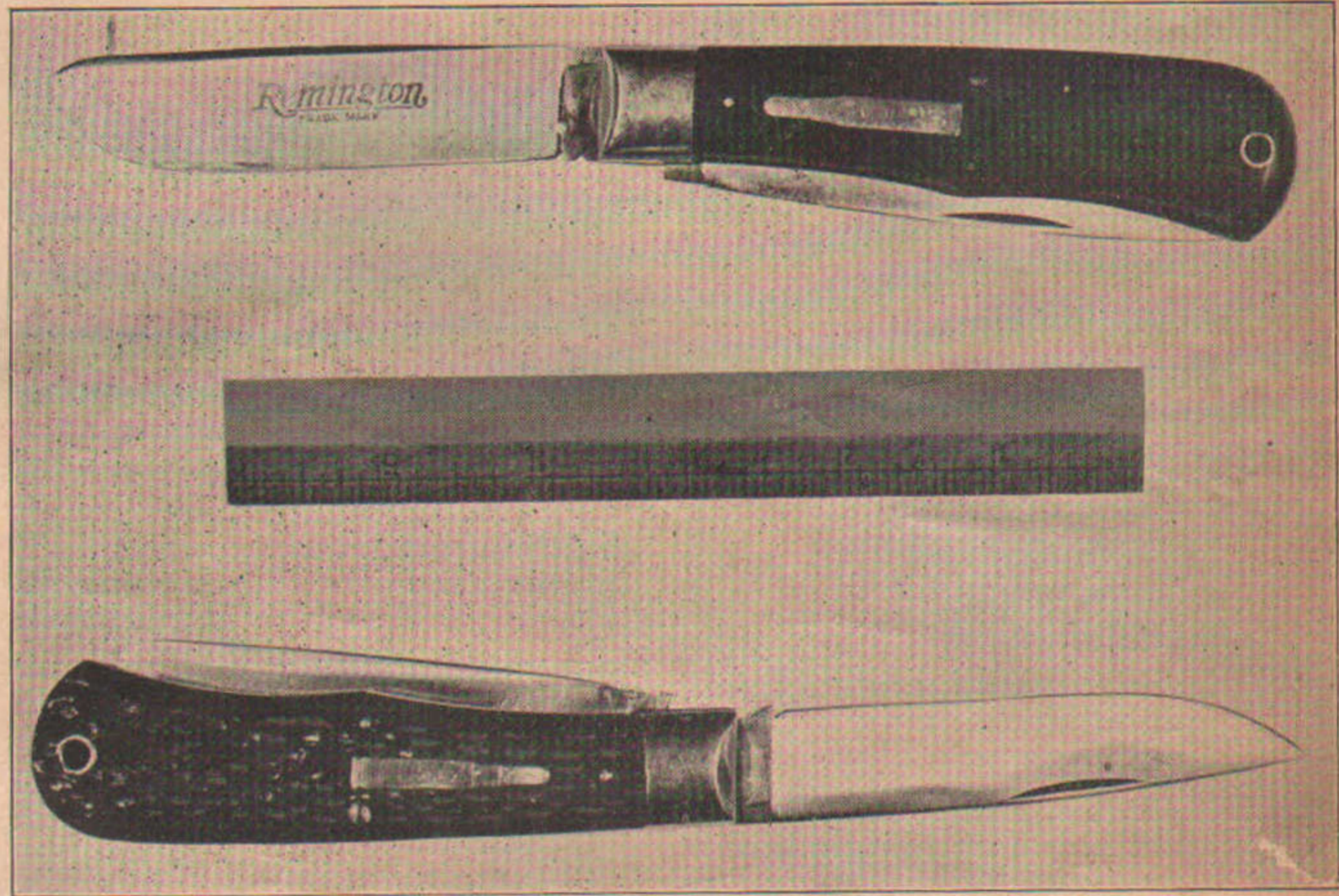
WHEN I was a kid our family spent all their summers in the Adirondack Mountains, and it was there that I developed my love for the wilderness and the grooved barrel. I was tall and thin, and fourteen when my father presented me with my first rifle, a Remington .22 caliber, to which many red squirrels, woodchucks and one deer fell the first season I had it. Cash was not over abundant in those days and I had to work to keep supplied with ammunition. Another kid and myself used to catch minnow and sell them to sportsmen at the hotel for bass bait at a cent apiece, and on rainy days we went to a nearby pond and caught bullheads for the hotel, often getting as many as 300 in a day and night. Just as soon as I got some surplus cash ahead I invested in my first real hunting knife, a most beautiful affair with deer-foot handle that I had longed for for many months through the enticing pages of Montgomery Ward. Beauty was its only virtue. The steel was too hard, and gosh! you ought to have seen that nice hair-covered handle when I got through skinning a woodchuck with it. By the way, I skinned that chuck on the porch of the hotel, much to the disgust of the manager, and then to get rid of the corpse I tied a big rock to it and sunk it off the boat landing. Next morning it floated up on the canoe beach and was generally unpleasant for the next few days. Since then I have had many hunting knives of many styles, shapes and steels. Some of them I have taken into the woods and used, because they looked good. Two only lingered and went with me a second time because of their proper design and material. One of these I lost in California many years ago. The other I was still using last fall.

As a result of experience, specialization, and enthusiasm, I came to the conclusion that I had no use for a sheath knife, or for one made of steel other than Wolstenholm or Joseph Rogers. I wanted a knife that would not betray me as a tenderfoot, that could be carried in the pocket, that would hold an edge for a reasonable amount of skinning, and that could be readily sharpened on a small whetstone. Only the English pocket knife would do this. Also I had peculiar ideas as to shape.

For many years I have been using a small sheath knife. I obtained from a manufacturing company a knife known as their "Skinning Knife," which has since been discontinued, and slightly remodeled the blade. This knife was very satisfactory, but the steel was entirely too hard. While in Panama I showed it to Dave Abercrombie, who was with me on an exploring expedition in that country. He agreed with me that the shape of it was ideal, so he took it and had it made up by the Green River Works in their own steel, which was very much better, and I have been using this knife ever since. It is most excellent, except in one respect, and that is that it is a sheath knife. It has to be carried either in the belt or in my rucksack. I do not like knives on the belt. I like to get all the weight I can off my waist and I also want the knife where it can be gotten at with cer-

tainty, that is in the pocket. Sheath knives are really a relic of the past. When a man is seen with one you almost at once put him in the tenderfoot class.

Then came the very last acquisition when friend Kahrs lately pushed in my pants' pocket a perfect peach of a pig puncher in the shape of a Remington No. R-1123 Hunters and Trappers Knife. I took it home and whetted its two blades to keen edge. Now a man who has been whittling and using a keen knife all his life does not have to have it long on a whetstone before he has a pretty good idea as to the quality



The Remington Hunting Knife in the coco-bolo and stag handles showing the two shapes of blade, with 6-inch rule to indicate size

of the steel that knife is made of. The knife should cut rather slowly but easily, the stone taking ahold of it in a peculiar way that only experience can teach. I came to the conclusion that this Remington knife had most excellent steel in it, and subsequent use showed that it held its edge remarkably well. I wrote to Kahrs about the steel and he gave me the following information:

Regarding the Remington Hunting Knife, I have taken this up with Mr. Willey, the sales manager of our Cutlery Division, and he is very much pleased indeed to know how you feel about the knife. He was so interested in what you had to say about the temper as compared to Rogers and Wolstenholm Sheffield steel that he took me into his confidence and gave me some rather interesting information. He said, "To begin with, Rogers or Wolstenholm never made steel, and their theories of tempering are about as widely apart as any two knife makers I can think of at the moment."

He further states, "Rogers' tempers hard and high while Wolstenholm goes

rather to the other extreme in this respect. We can honestly claim that our heat treatments are better, decidedly more uniform—and while possessing all the necessary hardness for keen cutting edges, our blades are 'tougher' and stronger and will withstand hard usage better.

"About a year ago a representative of one of the firms mentioned visited our Cutlery Works in Bridgeport. He stated after a very careful inspection of our heat treatment methods both for forging and for hardening and tempering he could see where our blade quality in this respect in every way equaled their best work with the added advantage that we, by our methods, could get uniform results that they could not."

Now lets look a little more into this new knife. It's a rather large, two-bladed af-

fair with a large, comfortable rosewood handle with hole in end of handle for lanyard. The knife is strong and heavy, and each blade is $3\frac{3}{4}$ inches long. The blades are thin enough to take a keen, good cutting edge, but not thin enough to be weak. The sharply pointed blade is just the right shape for delicate skinning of small animals and other fine work. The other blade with the more rounded point is exactly right for the heavy skinning of big game animals, and for heavy whittling. Particularly the shape of the point of this blade, with that part of the point towards the back of the blade dull and blunt, enables the hunter to slit the skin up the belly of an animal without any danger of cutting into the flesh or viscera. The knife has just the right length of blade and handle to make for efficient handling in both light and heavy work, and in whittling, butchering, and skinning. It is well worthy of a place in the kit of every hunter whether he be going light or heavy. It is a most excellent all-purpose knife, and will take the place of all other knives in an outfit.

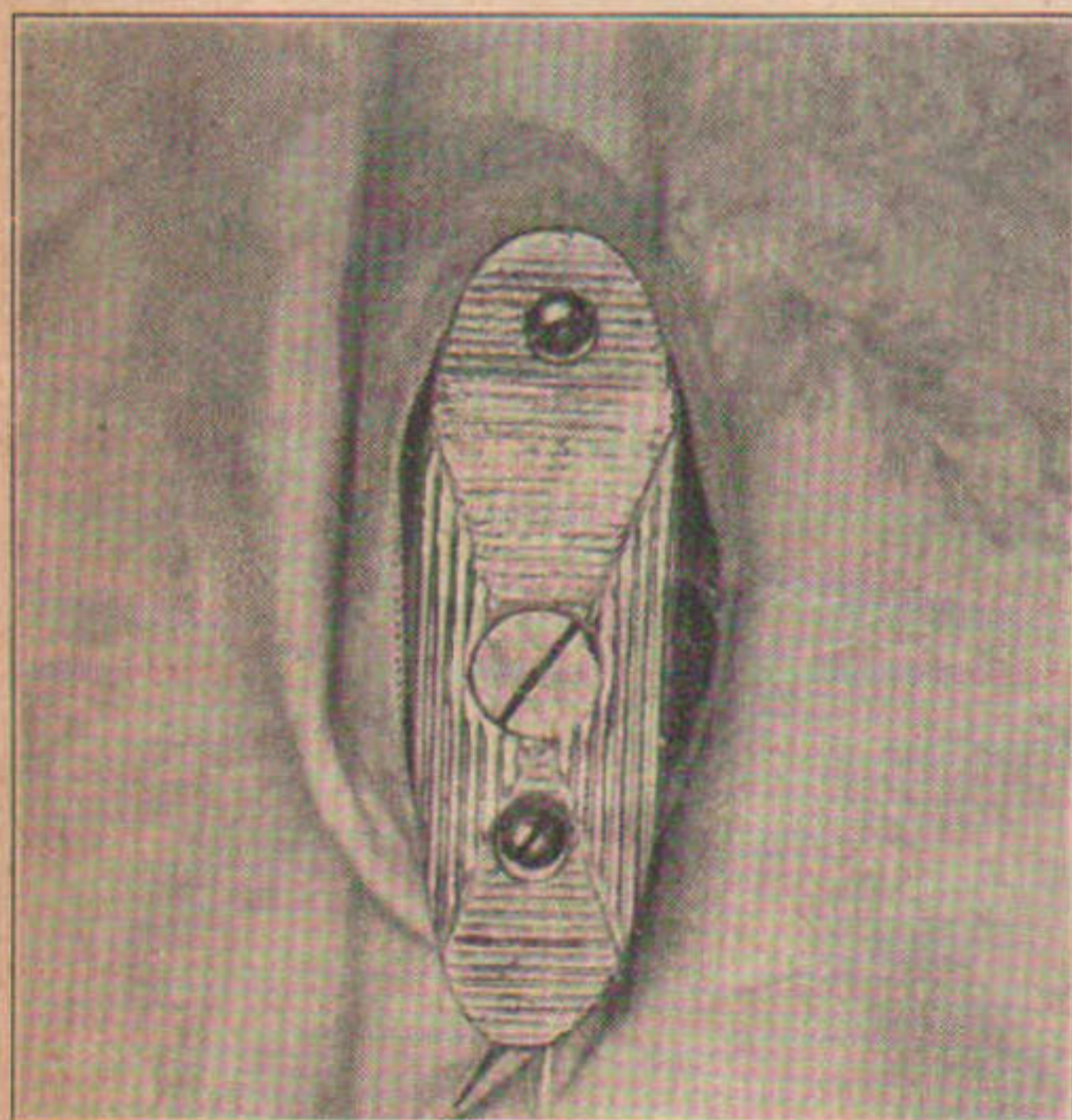
If You Can't Buy It, Make It!

Allyn H. Tedmon

THE American rifleman wouldn't be an American rifleman if he was satisfied with what he could buy. From the days of Daniel Boone, and before, the real riflemen of this country have been in love with their rifles. These same men have nearly always been years ahead of the arms companies in their ideas, and it is at this late date that we find the manufacturers, some of them, placing upon the market rifles built along the lines we want. And even at that we are never satisfied.

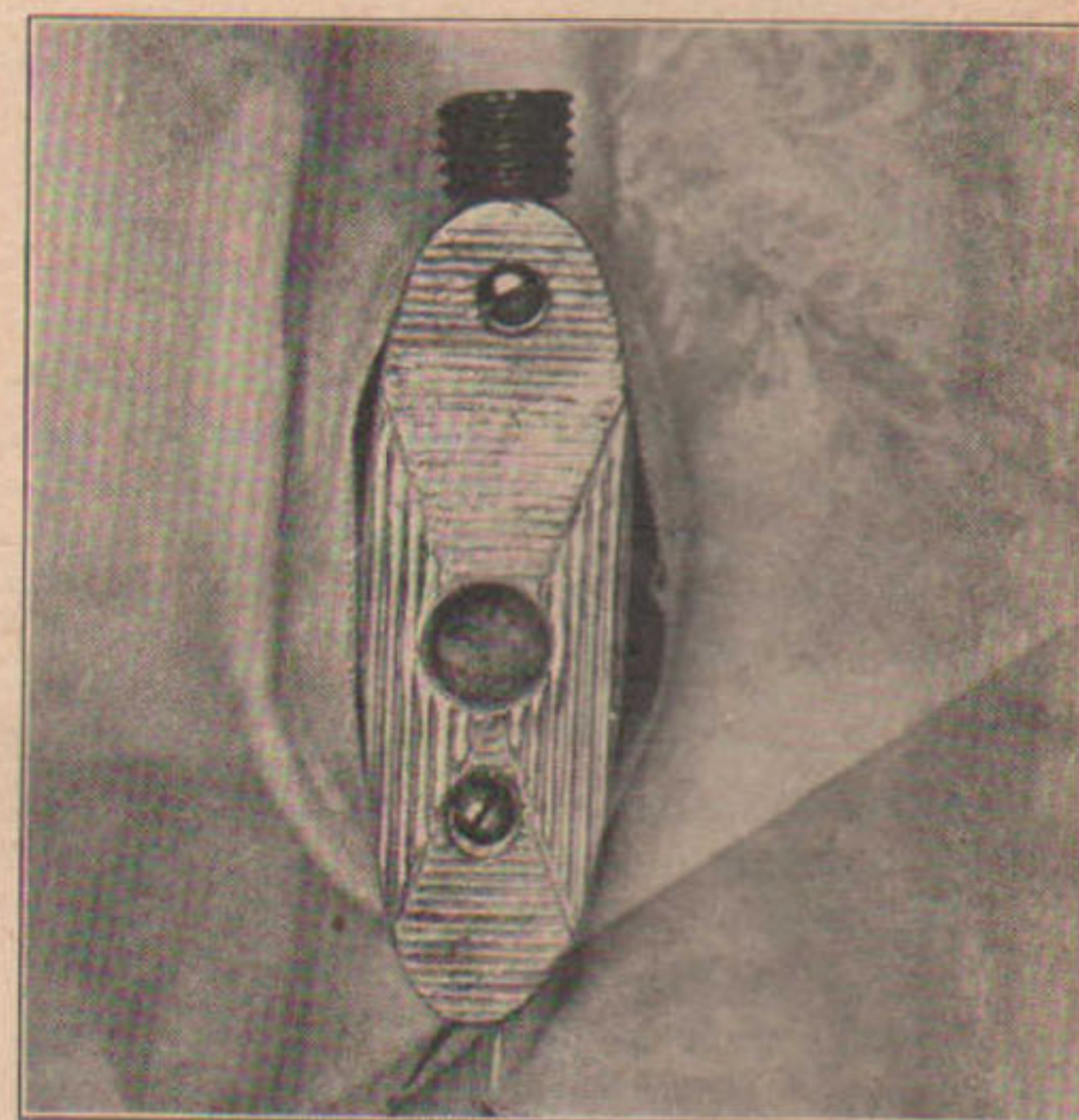
The regular stock is too short for me. I padded the thing up with leather and monkeyed along a long time, changing and fixing but never getting anywhere. At last I noticed an ad from that man Howe, down there in Baltimore. He really offered to sell some unfinished aluminum butt plates at probably about what they are worth. They were for the '06 Springfield, of course, but that gave me plenty to work on. I got one of the things and started in. To my great surprise I managed to work out a plate that

this all out on the plate so first thing we did was to drill a hole in the thing a trifle less than three-quarter inch. So far so good. Then we tapped this hole out with a regular standard three-quarter bolt tap. This gave a heavy, strong thread with a fairly long pitch. Now, after a little talking and showing I got the hole closed. We took a piece of three-quarter iron rod and ran a thread on it the length of the thickness of the plate. Next we cut this threaded portion off and after a little elbow work had a notch cut in the top or outside face of it. I screwed the plug into the hole, forked over the required four bits, and hiked for home. I screwed the plate back onto the rifle and after filling the hole in the stock with a field cleaner, extra front sight, rags, etc., I again screwed the plug into place and, presto, I went to



The Remodeled Rifle

Complete. Left: The trap closed; don't look so bad, does it? Right: Trap open, with plug shown resting on top of plate.



My pet rifle is the old Savage, Model '99, .250-3000, that I have packed many a mile and shot many a time. It has bumped along on my shoulder, in the hollow of my arm, under my leg and hung by its sling when I was too dead tired to carry it, up hill and down. It has slung lead into about everything in the West from prairie dogs to elk. It has acted the part of a pike and one time filled the bill for a sled runner when I lost my footing while climbing the steepest hill in the world and I slid down, down, on the little old rifle, which was saving the hide on my tummy. I always did like the pesky thing, but the more I fix it up the better I like it.

The main thing of interest are the Whelen sling and the butt plate. That sling cost all of 30 cents, if I remember. Made it out of an old .45-70 Springfield strap. The sling loops also will be of interest. They are the sling loops from two old Springfields, the trigger guard loops. They fit into the eyes on the rifle like they were made for it. Lyman sights, of course, and I filled in the rear slot with lead, makes a smooth, neat job and you miss the sharp corner of the regular blanks to catch your finger on. Yes, there is a name plate on her, but back of all the rest is that butt plate.

This butt plate has a story all its own.

really looked like I thought it might, and above all, it fitted pretty good. So far so good. But yet I wanted something more, I had wanted and wished for a trap in the butt plate ever since I first saw one. Sure I could have bought one, but around \$5. That caused me to become more nearsighted than ever. I just couldn't see it at all. And this in the face of that fellow who just recently took a shot at a lot of us poor suckers by saying that the American rifleman wanted something for nothing and wouldn't spend money for high-class work. Now, pardner, whoever you are, don't fool yourself, on me at least. You just show me the money and I will show you how to spend it. But you understand, I, like a lot of the rest, haven't it to spend. Sad, but true, nevertheless. Well, gradually the grey matter floating around in my head began to collect. An idea got in somehow and began to grow. The result was that I figured out how I could make myself a trap. And, best of all, it wouldn't cost hardly anything.

Down to the village smithy I went, the home-made butt plate in my pocket. This leader of the local anvil chorus is a fine fellow and got my idea right away and soon the trick was done. First of all, you know the model '99 Savage has a fine hole in the stock already to begin with. I had measured

bed happy, the old rifle at last had a trap in its south end.

Now, while the idea was a new one to me, and the arrangement is the first I have ever seen or heard of like it, yet it may be as old as the hills. That don't matter so far as I can see anyway, for it works, it is easy to make and any one who wants a trap and hasn't the gumption to make one had ought to go without. Of course I had a thick plate to work on, but I don't see why the same thing can't be done with all but the thinnest of regular plates. At least it wouldn't cost much to weld an extra piece on the back of the thin plates and then drill through the whole thing, tap it out, fit a threaded plug, bore a hole in the stock where there isn't one, and there you are.

A fellow who was handy with tools and had a shop to work in could replace the slot with a finger grip. However, I selected the slot as it was easy to make and can be opened with a screwdriver, coin, point of knife or most anything. At any rate I had the longed-for trap and now when I pick the little old shootin' iron up, there is nothing missing. She's full rigged from butt to muzzle and worth more to me than ever. A thing of beauty and a joy forever.

Falling Bullets

By Major Glenn P. Wilhelm
Ordnance Department, U. S. A.

PART 2

THE later firings in the first United States official tests were held over sand at Daytona Beach, where it was possible to recover the bullets themselves.

The object of the vertical fire tests in Florida was to determine the vertical time of flight of Small Arms Ammunition for purposes of comparison, and to obtain certain data regarding the laws of air resistance to small-arms projectiles of various weights, shapes and velocities.

For the Miami tests, an observation tower was selected so located that under normal conditions it was surrounded on all sides by shallow water extending several hundred yards. This water was almost invariably calm. The tower was fitted up with head cover, as it was the intention to bring the falling shots down on to the tower itself in order to facilitate observation.

The heavy Browning Machine Gun was used in the first two tests. This gun was installed by bolting the legs of the Cygnet Tripod to a heavy wooden frame with the forward legs of the tripod nearly horizontal and the barrel pointing vertically. When the Mann steel "V" Rest was substituted for the machine gun in some tests, the same tripod arrangement was used, the "V" Rest being substituted for the gun and fitted to the tripod by the lugs formed on the bottom of the steel trough for that purpose. The "V" then of course ran vertically instead of nearly horizontally, as in normal firing.

Inclination of the machine gun, or of the Mann barrel, from the vertical, necessary to correct for wind, drift or other error in the vertical flight of the bullet, was measured by means of the ordinary machine gun clinometer, applied to the panoramic sight bracket to measure the north or south inclination, and to the side of the receiver to measure east and west.

It was found in some tests, held with the Mann barrel and with various shoulder rifles, that accurate measurement of the barrel inclination could be obtained by merely placing the clinometer on the muzzle of the gun, changes being made, not by moving the gun with relation to the rest, but by moving the entire "V" block by means of the ordinary tripod adjustments. The necessity for accuracy in inclination measurements may be appreciated when it is noted that a change of 25 mils—less than one and a half degrees—moved the bullet entirely off the landscape so far as any observation from the tower was concerned.

Adjustment of the barrel of the Mann Rest was of course simple, it being merely laid in the "V" and held there by a gunner as it was fired. The various types of sporting and

military rifles, however, offered another problem, with their varying external shapes of barrel, sight and stocks. Tests proved, however, that any of those tried could be laid in the "V" rest with entire accuracy from shot to shot, although of course it was necessary to hold the rifle in the vertical "V" during firing. There remained therefore only the necessity for measuring the barrel inclination, and the use of the clinometer on the muzzle proved that in the rifles tried out, at least, the muzzle was cut out at right angles to the bore, allowing accurate vertical alignment with a zero reading of the clinometer.

The arms fired in the tests consisted of the Browning machine gun with various sorts of ammunition; the Mann barrel for our service cartridge; the French and Swiss service rifles; the .351 caliber Winchester self-loading rifle (sporting); the .35 caliber Remington autoloading sporting rifle; a British Model, 1914, sub-caliber rifle arranged for the .22 caliber Long Rifle cartridge, and the .45 caliber service automatic pistol, Model 1911. In all, eight different arms were used in the vertical firing tests. The ammunition fired included over fifteen different types.

Out of the five hundred or more bullets fired vertically with intent to cause them to strike the tower on return, but four struck the tower with its upper floor area of about 100 square feet, and one struck a boat moored to the tower. Two of these were recovered, both of them Model 1919, boat-tailed, one landing in the boat and not bouncing out of it, the other landing in a pail of water used for cooling the Browning machine gun. One of them made a shallow indentation in the edge of a thwart of the boat, conforming to the bullet traveling at an angle of about 45 degrees with the vertical, the other making an almost imperceptible dent in the bottom of the pail. The form of this dent indicated that the bullet had either not returned base first and bullet vertical, or else had turned sideways on the impact of its base with force sufficient to make a partial imprint of its length.

Two others struck the armor-plate without leaving a mark, and a fifth, a service 150-grain bullet, struck the soft pine lower platform near the edge and bounced off into the water. The imprint, plainly showing the shape of the base of the bullet, was round, about the bullet diam-

eter, and not more than 1/16th inch in depth. The returning velocity of the service bullet is evidently not much in excess of 300 f. s.

It is evident from the amount of splash made by the impact of the returning bullets, by the various sounds emitted from the falling bullets, and by the discrepancies in results, that all bullets do not retain their spin and return base first.

Other investigators have stated that the British service bullet and the German service bullet return base first, but that there is a certain critical angle beyond which the bullets will return point first. Between these two extremes the bullets return partly sideways. It is probable that the majority of the bullets fired in these tests, except those already specifically mentioned, return base first, although in a great many cases there is undoubtedly considerable wobble.

Although previous experimenters in vertical firing make no mention of having observed the fact, all bullets fired vertically and returning close to the firer, announced their coming at least a second before striking the water, by a very distinct and peculiar whirring whistle, not unlike the note of a cricket in some instances. With much wind blowing, such as in one test where 15 miles of wind prevailed, the noise becomes less noticeable, but under still conditions the noise of bullets returning 120 to 150 meters away was clearly audible. The noise of the returning Model 1919 bullet was alleged by some observers who had been under much artillery fire in France, to be very similar to the whistle of the high velocity enemy shell popularly known as "whiz-bangs."

The Swiss service bullet, which returned in the most uniform time of any fired vertically, had a very peculiar noise, difficult to describe, but agreed upon by the observers as being a "chirp," not unlike that of some birds, a peculiar dry buzzing or chirping noise and not the mixture of whistle and whir that dis-

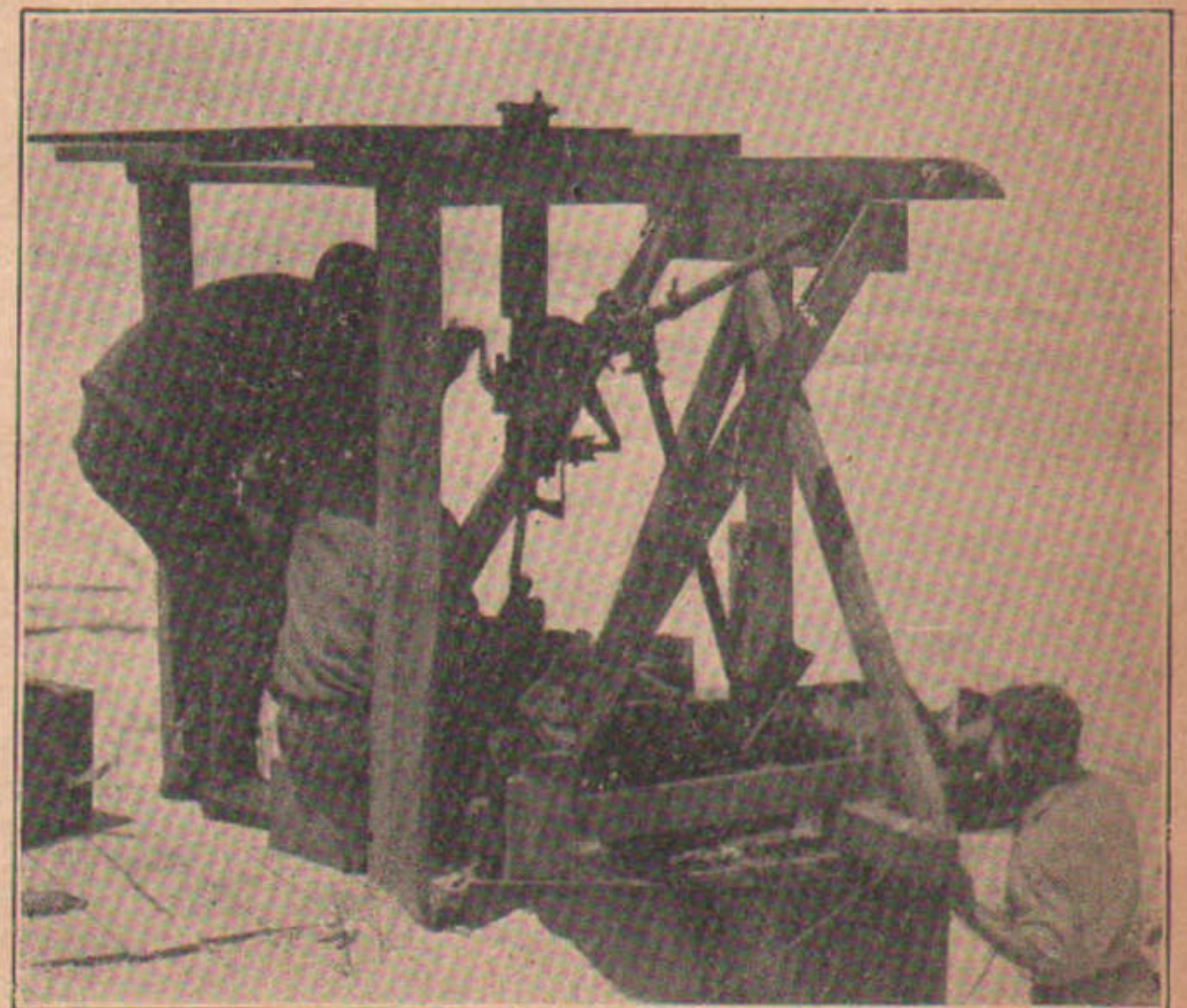


Fig. 1. Browning Machine Gun Firing Vertically at Daytona Beach, Fla., for the purpose of determining the characteristics of vertical fire, including the time of flight.

Courtesy of Army Ordnance



Impacts in Hard Beach Sand of Bullets Fired Vertically Upward

FIG. 2. Left. .30 caliber service bullet, returning base first after having reached a height of about 1¾ miles and requiring approximately 50 seconds to go up and back

FIG. 3. Center. .30 caliber service bullet fallen on its side instead of its base as the distance from the gun to the impact was sufficient to allow the bullet to half-turn from base-first to point-first

FIG. 4. Right. .30 caliber boat-tail bullet. Time of ascent and descent about 1¾ minutes. The bullet returned base first, but due to its much greater time of flight and consequent height, together with its increased weight, has considerably greater penetration.

tinguished the other bullets. This bullet made much disturbance on entering the water, more so than the service bullets. The French service bullet made a very loud whirring, whistling noise, but had a soft quiet entrance into the water.

The first burst fired in these tests fell too far to the south to be plainly observed, and would have escaped notice, but the very noticeable noise drew the attention of the observer to their return 150 meters or more away. This burst was of 1906 service ammunition. All of the large caliber bullets, such as the .351, the .35 and the .45 pistol bullet, whirred very noticeably.

When the wind was light, the dispersion of a burst was very small. Repeatedly a burst of ten shots was returned within a circle of 24 meters in diameter. When, however, a bullet returned in time much less or much greater than the others, then it rarely fell with the main group, landing 75 meters away at times possibly so far away in other instances that the bullet was never noted in its return. Under the conditions of one test with Mann barrel, where three shots were fired with ten seconds interval, repeatedly one bullet of the three returned close to the tower, but the other two were never noted. Evidently they encountered varying wind currents.

Analysis of the wind prevailing at the ground level, and the deflection put on the gun to bring the bullets close to the tower, reveals contradictions that seem to indicate that at one time the ground currents may indicate the general strength of the currents higher up, but another time the wind at the ground level is not the current that is moving the bullet. This is easily understood when it is remembered that the bullet is spending most of its time above the thousand foot mark, and that there are two seconds of its flight in which it moves upward 16 feet and

back the same distance. The greatest deflection used was 110 mils ($4^{\circ} 40'$) necessary with a 15-mile wind to bring the Model 1919 bullet at 2,400 f. s., back close to the tower. In one instance, fire with the service cartridge was altered to fire with the Model 1919 bullet at 2,600 f. s. without altering the inclination of the gun, and the bullets continued to return close to the tower. Another instance, however, resulted in no record whatever of the return of the Model 1919 bullet, and it was necessary to take off 25 mils of inclination toward the wind, and add 10 mils of north inclination, which apparently was not affected by the wind, which was then from the east, and blowing 5 miles per hour. Generally speaking, it is apparently necessary to give the gun about 5 mils inclination for every mile of wind, *i. e.*, a mile of wind equals 17.20 minutes, in contrast to the fact that in horizontal firing at 1,000 yards a mile of wind equals about one minute.

One of the puzzling things about the time of return of the various types of bullets was the peculiar separation of a portion of a long machine gun burst when the Model 1919 boat-tail bullet was fired. A portion of the group would return in about one minute and six seconds, whereas the majority of the shots in the burst would not return until one minute and forty-six seconds.

This was taken to mean that this bullet was in a state of delicate balance which was so easily disturbed that the vibration of the machine gun barrel or some other cause, was sufficient to make the majority of the bullets lose their gyro-static stability at high altitude and return "tumbling," thus unduly prolonging their time of flight. Later experiments showed that this bullet was unstable and that a similar bullet correctly designed had a vertical flight of about one minute and six seconds, thus confirming this interpretation.

"The vertical flight time of the 160 gr., .30-30 blunt-nose bullet at 2,600 f. s. and the very sharp point, 'pencil point' 172-grain match bullet at the same velocity, seems to indicate that the co-efficient of form plays a small part in the actual flight time of a vertically fired bullet. The mean time for the first bullet was 50.4 seconds; for the second 51.4 seconds, a difference of but 1 second, which may be charged to the 12 grain additional weight. The first bullet is very blunt-nosed, having a co-efficient of form about .80, and a ballistic co-efficient of .31; the other has a very sharp, slender point, formed of straight lines like a well-sharpened pencil, with 'c' value of .50, and a ballistic co-efficient of .53.

"Again we have the 'guard' cartridge, using the service bullet at a velocity of but 1,200 f. s., or 44 per cent of the velocity of the service cartridge, still using up 83 per cent of the time required for the flight of the service bullet—40.8 seconds to 49.2 seconds.

"The tiny .22 Long Rifle bullet, weight 40 grains, velocity 1,050 f. s., ballistic co-efficient .12, requires 72 per cent of the time used by the service bullet, although its velocity is but 39 per cent, and its co-efficient is but 31 per cent that of the service bullet. The reversal of the service bullet in the case, and firing it base first, resulted in its return in 30.4 seconds or ten seconds less than the time of the 'guard' cartridge, showing the retarding effect of the base, and the accelerating effect of the point on the upward and downward trip. This figure agrees exactly with the results obtained by the Germans in firing their own service bullet reversed."

The same tests which were so easy to carry out at Miami were very difficult to execute successfully at Daytona. The method of

(Continued on page 18)

Individual Instruction in Rifle Practice

By Col. A. J. Macnab, U. S. A.

PART 2

THE second sighting and aiming exercise refers again to Plate 2, appearing in the first installment.

a. A rifle with sights blackened is placed in a rifle rest and pointed at a blank sheet of paper mounted on a box. (See Plate III). Without touching rifle or rifle rest, the coach takes the position illustrated and looks through the sights. The coach directs the marker by command or improvised signal to move the small disc until the bottom of the bull's-eye is in correct alignment with the sights (see Plate II, Fig. C), and then commands "Hold" to the marker. The coach moves away from the rifle and directs the pupil to look through the sights in order to observe the correct aim.

8. *Third sighting and aiming exercise.*
 a. The object of this exercise is to show the importance of uniform and correct aiming, and to instill into the mind a sense of exactness. At 50 feet and with a small bull's-eye, a man should be able to place all three marks so that they could be covered by the unsharpened end of a lead pencil. (See Plate III.)

b. This exercise is conducted as follows: The rifle with the sights blackened is placed in a rifle rest and pointed at a blank sheet of paper mounted on a box. The pupil takes the position illustrated and looks through the

marker then moves the disc to change the alignment. The pupil and coach, without touching the rifle or rifle rest, repeat this operation until three dots, numbered 1, 2, 3, respectively, have been made. These dots are then joined together to form a triangle and the pupil's name written under it. The size and shape of the triangle will be discussed and the errors pointed out. This exercise will be repeated until proficiency is attained.

c. This exercise should also be held during

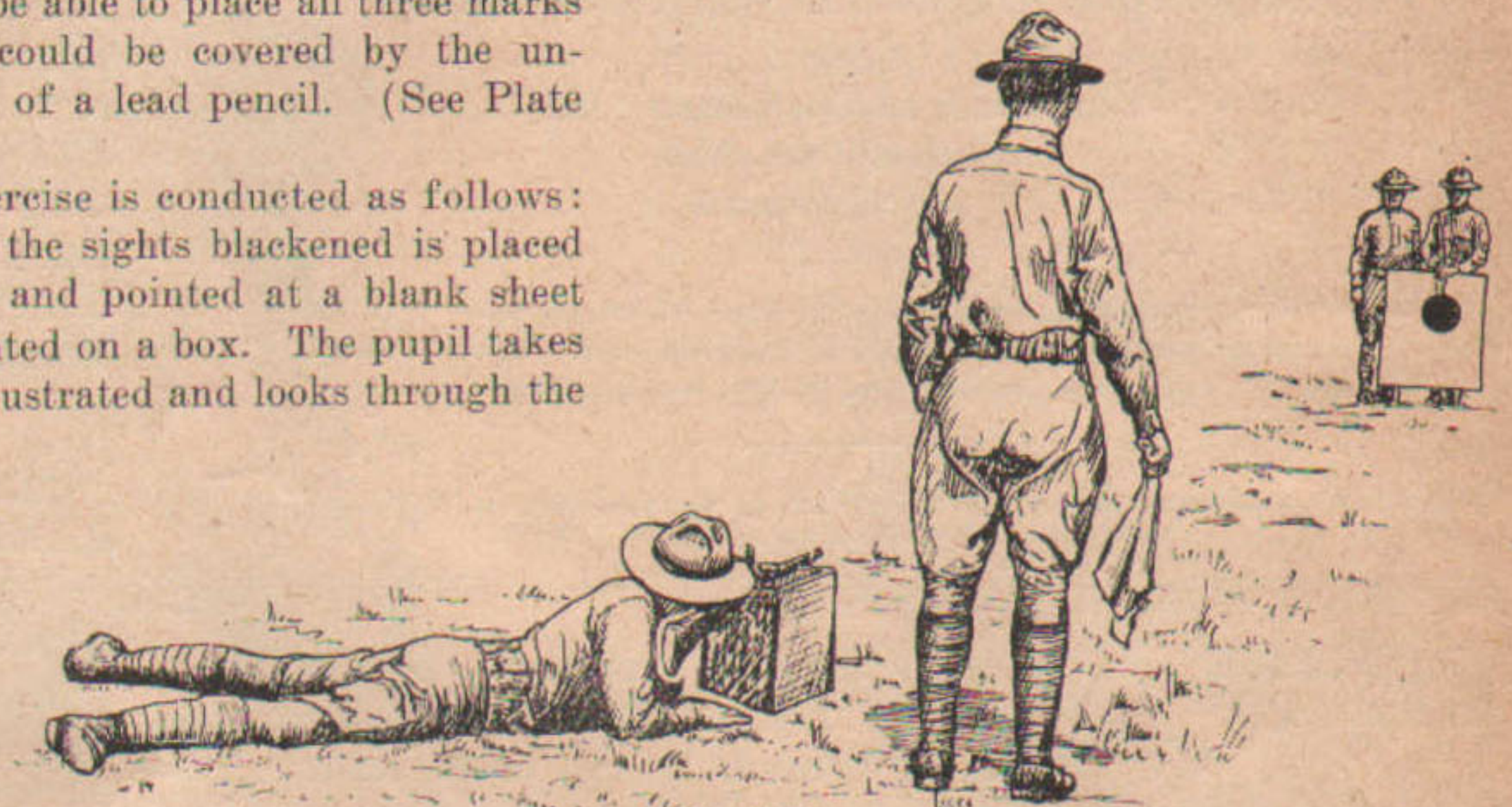


Plate No. 4



Fig. A



Fig. B

Plate No. 3

b. The marker moves the disc out of alignment. The pupil takes position and directs the marker to move the disc until the bottom of the bull's-eye is in correct alignment with the sights. The coach then looks through the sights to see if the alignment is correct.

c. The coach aligns the sights on the bull's-eye with various slight errors to determine whether or not the pupil can detect them.

sights without touching the rifle or rifle rest. The pupil directs the marker, by command or improvised signal, to move the disc until the bottom of the bull's-eye is in correct alignment with the sights, and then commands "Hold" to the marker. The coach then looks through the sights to see if the alignment is correct. Then without saying anything to the pupil, he commands "Mark" to the marker. The marker, without moving the disc, makes a dot on the paper with a sharp-pointed pencil inserted through the hole in the center of the bull's-eye. The

the period of the preparatory training, at 200 yards on a 10-inch movable bull's-eye (see Plate IV), and if time permits, at 500 yards on a 20-inch movable bull's-eye. These long-range triangle exercises teach the men to aim accurately at a distant bull's-eye the outlines of which are indistinct. If the exercise is properly handled it helps greatly to sustain interest in the work. At 200 yards a man should be able to make a triangle that can be covered with a silver dollar, and at 500 yards a triangle no side of which is over 2 inches long.

d. Tissue paper will be used to copy off each pupil's triangle at long range. The name of the pupil making the triangle will be written on the tissue paper under the triangle. These tracings are sent back to the firing line so that the pupil can see what he has done. The squad leader will turn over all triangles to the platoon leader for his inspection.

e. The sighting and aiming exercises, especially the 200-yard triangle work, will be carried on during the time devoted to the second and third step. The purpose of continuing these exercises is to bring backward men up to the proper state of proficiency, and to assist in keeping the men interested.

f. Competition between the individuals of a squad to see which one can make the smallest triangle, is of value in creating interest in this exercise.

SECTION III.

Second Step, Positions.

9. *Importance.*—Correct position is of great importance in teaching men to shoot. Instruction in position involves blackening the sights, use of the gun sling, taking up of

(Continued on page 15)

ARMS AND THE MAN



Successor to
SHOOTING AND FISHING
1888-1906

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THE POLICE PANACEA

AN international agreement between nations to restrict the manufacture and sale of firearms is the latest idiocy proposed in the saturnalia of antifiarm legislation. This crowning glory of hysteria emanates from the International Police Conference recently concluded in New York. It followed, in the form of a recommendation, an address by Chief Magistrate William McAdoo, who declared "the pistol is the curse of America."

America has been credited recently with possessing an unusually large number of curses, but strangely enough, the one which is most apparent has presumably been overlooked—the "Curse-Hound" himself. As long as his genius persists, curses in plenty will be found, but there could conceivably be no greater curse than that which the Curse Hound seeks to saddle upon us—the disarming of the reputable citizen.

It is not to be wondered at that the policeman of today, ignorant of the proper use and care of firearms, and perhaps quite as much afraid of the potentialities of a weapon in his own hip pocket as he is of the "gat" carried by a criminal who knows how to use it, should turn to the law, under which all policemen move and have their being, upon the false premise that an international agreement upon the firearms question will prove an immediate and effective panacea. In the light of the results of other "International Agreements" this touching faith is hardly justified.

There are many points in connection with the anti-firearm discussions of the police conference, however, which are worthy of note.

Most significant among them was the statement of General Sir William Harwood, head of New Scotland Yard. English criminals, he said, feared the severe British laws too much to carry weapons, and that the extreme penalties had operated to curb to a great extent those crimes in which firearms figure.

In this respect, the experience of the London police would seem to supply the answer to our own situation regarding the use of firearms by criminals. Severe penalties instead of short workhouse or jail sentences with the alternative of comparatively light fines, to be imposed upon all persons with police records found carrying weapons will accomplish far more than prohibitory legislation of the negative type.

If the laws cease to regard "pistol toting" as a misdemeanor and treat it as a serious offense with an adequate

punishment, this habit of the lawless will speedily lose popularity.

The weakness of all legislation which seeks to cure crime by preventing the manufacture of firearms—although he did not mean it that way—came from Isel Otsuka, Secretary of the Home Department, Tokio, Japan. According to this delegate, the greatest danger facing peace enforcement throughout the world is the use of the bomb. Restriction of firearms, he declared, could be easily accomplished, but great vigilance would be required to stamp out bomb manufacture. This statement, in connection with statements from the police heads of Peru, Chile, Brazil, and Argentina, that the firearms problem in their countries is negligible as the criminals use *knives*, *razors*, and *swords* instead of pistols emphasizes the fact that if every firearm were wiped out of existence tomorrow the thug and murderer would find adequate weapons still to hand among bombs, knives, swords, and razors to enable him to inflict as much if not more damage to society, property and human life as he does today.

"LEND A HAND"

EVERY reader of ARMS AND THE MAN has an opportunity to do much good for the shooting game in the United States without any very great exertion on his part.

The Palma Trophy, representing the long range team championship of the world, is to be again placed in competition at Camp Perry this year. The International Free Rifle Matches at three hundred meters, carrying the World's Team Championship and Individual Championship with them, are to be fired at Perry. The International Small-Bore Dewar match will be fired as usual, and the regular National and NRA matches with pistol, rifle, and shotgun, plus the School of Instruction for civilians, will round out the most elaborate program that shooters of this country have ever had the privilege of witnessing or competing in.

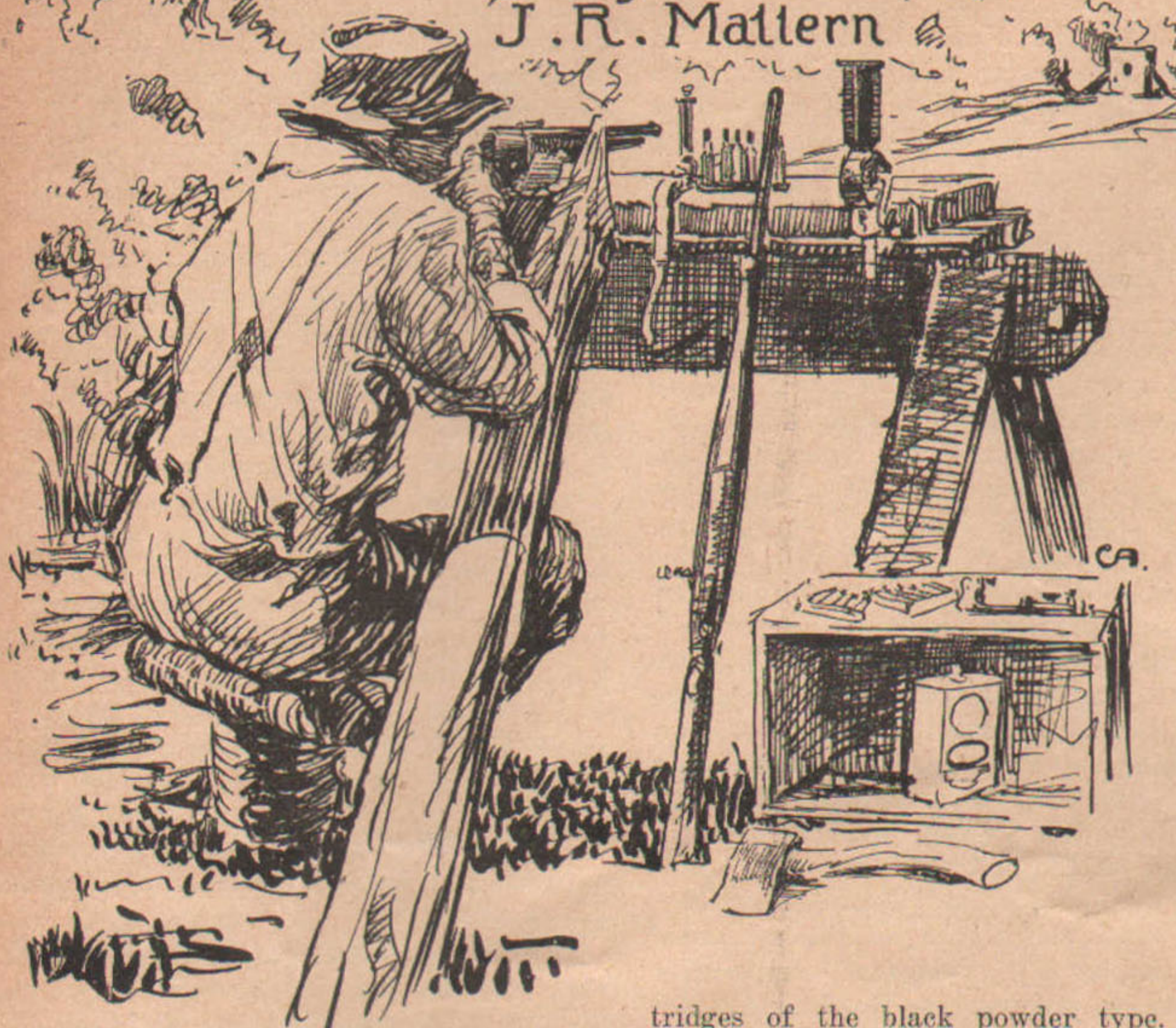
Seizing on this opportunity, a broad program of publicity through the newspapers, sporting magazines, and trade publications, has been outlined and is being gotten under way. Dispatches are being turned over to the headquarters of the various press associations once a week or more often, and monthly articles are going out to the various magazines. It is through the newspapers that the most publicity is to be obtained. The newspapers are interested in publishing only such news as their readers want. Sixty per cent of the dispatches which have been turned over to the newspapers in the past two months have failed to appear in print in the vast majority of papers served by the Associated Press, United Press, International News, and similar news services. This failure to print the dispatches is due to the conviction in the minds of the local editors that the people in their community are not interested in rifle shooting. Every person who is interested in rifle shooting will be doing himself a service, and will be doing the game a great service, by letting the newspaper syndicates and the local papers know that he wants the advance information on the National and International matches at Perry in September. There will be no reason this year for sportsmen not to know the progress that is being made in getting foreign teams to this country and in planning the big matches, as far as the broadcasting dispatches from the headquarters is concerned. It will be up to the individual members of the National Rifle Association to see that the dispatches sent out from Washington, New York, and other cities, are printed locally.

The rifle shooting game has always suffered from lack of publicity. This year there is a real opportunity and a real effort being made to get the publicity for the game which it should have, but if the effort is to bear fruit, it must be backed by every person interested in the sport.

Lend a hand!

Handloading Ammunition

By
J. R. Mattern



CHAPTER 16

"ULTRASPEED" AND "SUPER" LOADS

ABOUT 1912 the Du Pont Company and others began telling shooters that various popular cartridges could be modernized and improved by increasing their velocities. This subject of ultra-loads and specially speedy loads has been a prolific source of interest among shooters ever since. It covers the borderland between standardized ballistic practices and experimental stages of development, and in some instances extends on into the actual unknown. It is one angle of the art of science of shooting which is always worthy of attention, always prolific in interest.

By 1921 or 1922 the cartridge factories, or at least two of them, had swung round to the popular idea. They began furnishing advanced loadings in some half-dozen or more cartridges of the smokeless type. These factory loads are of necessity like all others in that they do not give the last fifty feet or hundred feet of velocity that is perfectly practicable in most guns. They must be safe in old or weakened guns, and in guns with tight chambers, and must be safe when the loading machine puts in an extra grain or two of powder.

The modern ultra-loads, as they often are called in the magazines, are distinct from the "high-velocity" and "high-power" loadings originated and furnished by the factories some years ago in car-

tridges of the black powder type. The latter, when smokeless loaded to standard velocities frequently gave very low pressures—15,000 pounds, 20,000 pounds, and 25,000 pounds. Their rifles, such as the Model 1894 and 1893 Marlin, the 1886 and 1892 and 1894 Winchester, and the 1899 Savage, were entirely capable of handling 30,000 pounds pressure, and in most instances were safe enough up to 35,000 and 40,000 pounds. The factories merely increased the charges of the same smokeless powder, and gave us the well-known high velocity 25-20 to 44-40 series, and the equally known 32-40 to 50-110 series. No changes were made in the bullets, and their velocities were only about 1,700 feet, with one or two exceptions.

Improvements of cartridges of smokeless type are based on altogether different factors. Their working pressures with old standard loads are well up to the comfortable limit for cases and guns, consequently more modern or better-suited powders had to be substituted. Next, the bullets were manipulated, made lighter or heavier or changed in shape or otherwise, to give increased power, which does not always mean increased velocity. And in connection with these factors, and beyond them, twist or rifling, chamber tolerances, even the primer providing ignition, have been made to yield their influences. The little things appear to grow increasingly important as we refine practices and obtain results undreamed of twenty years ago.

Those who have been studying our tables of modern loads will have noted that there are a dozen or more cartridges for which very satisfactory handloads of advanced ballistics are available. Among them may be mentioned the 30-1906 with 150-grain bullet at 3,000 f. s., and the 180-grain bullet at 2,725 f. s.; the 30-40 with 220-grain bullet at 2,200 f. s., with 180-grain bullet at 2,500 feet and with 150-grain bullet at 2,800 f. s. the 30-30-170 at 2,250 f. s. or with 150-grain bullet at 2,500 f. s.

The .33 Winchester is speeded to 2,253 feet, the 32 Special to 2,300 feet, the 35 Rimless to 2,233 feet, the 250 Savage to 3,200 feet with regular bullet or to 2,860 feet with 100-grain bullet, the 25-35 and 25 Rimless to 2,900 feet with 87-grain bullet. Many details of improvements too intricate to explain over again here will reward a study of the loads in the tabulations, including the pressures and remarks columns.

The entire series of Newton cartridges represent efforts to apply modern developments in powders and bullets in the form of ultra-loads. Among the very latest developments are the 400 Whelen and the 25-20 and 32-20 High Power, giving more than 2,000 feet velocity. Doubtless others will be developed as time passes.

These figures show the possibilities. It is not the intention of this chapter to tell of the advantages of these high speed or more powerful loads. That is a broad subject which we all love to follow to the extent of maintaining ARMS AND THE MAN and other magazines with our subscriptions. Even the fundamental components needed to give the desired results can be specified only briefly, as in the tables of loads.

One group of riflemen maintains that high velocity is everything in the obtaining of killing power, and they would improve their cartridges by lightening the bullets and driving them at extreme speeds. Other riflemen speed up our standard bullets as much as possible within limits of pressures, while still others use heavier bullets, relying on greater sectional density of the projectile to give it ranging power in the air and smashing power in flesh and bone. The handloader can make his own selection of policy, provided only that he observes certain details in the actual loading, hereafter to be explained.

Handloaders should note that the ammunition factories keep strictly away from maximum loads so far as furnishing them to the general public is concerned. There is a reason—there are several reasons. A rough and ready shooter will not want to be bothered with consideration of them. He will not want to be under the necessity of taking the necessary pains and of making absolutely certain of small features. He will not want to buy the sensitive scales, the micrometer caliper, the equipment of case resizing dies and other tools needed. For him the underloaded standard ammunition is the thing to load.

One's ordinary shooting should not be done with maximum loads. The latter are special purpose loads, for hunting or for target shooting at long range or where the extreme of accuracy is required. An experienced shooter knows that the most satisfactory handloading, at least, is not obtained in handling loads giving the very highest pressures. Aside from his business shooting, as it may be called, he may fire a few practice shots with the maximum charge to ascertain and to test the high limit in his rifle, but for routine practice he drops back quickly to a conservative pressure and load for each particular gun. Maximum loads involve several kinds of trouble with brass cases and with bullets, or rather the possibilities of difficulties in handloading, which are not encountered in preparing ammunition of factory standard pressure or slightly reduced charges. While serving their special purposes they are worth whatever they cost in extra effort required, but they cost too much to use exclusively.

To get the point of view essential in loading ultra-loads with satisfaction, let us say that at first glance a shooter might take the ballistic dope sheet as his Commandments, his creed. So many grains of such and such new powder, with a bullet just exactly this or that, would give precisely the calculated results. So we might think, yet things do not work out that way. Within limits, the individual gun is everything. Its peculiarities and personality, together with the requirements of the purpose in view, must determine the exact loading details.

To use correct powder, in correct charge, with proper bullet, is not enough, for hardness, diameter and length of bearing of a bullet have influence, as well as weight. The power of the primer and the weight of the firing pin blow effect the pressure, as does dirt in the case, air space, depth of seating of the bullet, tolerance in the rifle chamber and throat, groove diameter of barrel, twist and even depth of rifling. A balance must be struck.

In the Remarks column of the tables of loads, you will note that some combinations are designated as best for normal handloading. The reason usually is that those are not ultra-loads. They swell and set back cases less in guns with normal chambers. In selecting your particular load from among those given, scrutinize pressure as compared with velocity, and read again the chapter on powders. Too slow a powder seldom gives trouble from excessive pressure, but the charge will not all burn. Grains will be found in the bore and may get back into the action. Pressures will be irregular; inaccuracy will result. Too fast a powder sets up head pressure in the case without maintaining it up the bore or developing extreme velocity. The tables contain loads useful under all sorts of circumstances, hence each shooter must select with eyes open.

It is best to start your ultra-load with five grains less powder than the tables specify, even though you fire only three or four such shots. Observation of the result will go far to tell you the nature of your components and your barrel. Recently a shooter obtained a new barrel on a 32-40 Winchester, and in it was unable to use with satisfaction any of the charges his old barrel handled in a normal manner. He has to use about four grains less powder.

Increase the load a grain at a time, using identical bullets. In a particular rifle you might actually have to go one to three grains above the ultra-load as given in the tables, to obtain the given velocity and pressure, but be very sure of your observations and your risk. Some Ross 280 rifles and Newton rifles often are very loosely chambered and must be so overloaded to obtain from them full extreme velocities. More rifles will require underloads than overloads.

Be quick to detect signs of excessive pressure, and don't hesitate to believe them. Act accordingly at once. *Cut down the load* without further firing, even though you have to tear apart or throw away cartridges already prepared.

Never attempt to put together ultra-loads without accurate, sensitive scales—never trust the marks on the measures. (See chapter 9.) Tables of comparative weights of powders in Bond and Ideal handbooks are not accurate enough for your purpose and can not be made accurate enough. Years ago I took a No. 5 Ideal powder measure to a drug store where I adjusted it to throw exactly 48 grains of No. 20 powder, and cut with a sharp knife a brand new mark on the drum to indicate that setting. In dozens of trials since then we can set the measure with certainty no nearer each way than within two grains of the charge. Without checking the setting with scales, we may get 46 grains or 50 grains. Once set, the measure nearly always throws charges of this powder that are uniform to within one-fifth of a grain, and its greatest variation is only half a grain. A shooter recently reported in *The Dope Bag* in *ARMS AND THE MAN* that he had started loading with 10 per cent reduced charge, setting his measure by the marks on the drum, but afterwards found he was using a charge excessive by one grain, owing to errors in the comparative table or the marking on his measure. *It can't be done without scales.*

You will find most jacketed bullets to be very exact in diameters and weights, yet for ultra-loads don't trust them without checking with scales and micrometer caliper—comparing the diameter with that of your individual barrel. When you are loading pressures near the limit for your gun, an oversize bullet or one five grains too heavy might add several thousands of pounds, bringing the total beyond the danger point. Use the light bullets to-

gether, the heavy ones another time, and separate small and large ones, of course manipulating powder charges accordingly. It may be desirable to measure the groove diameter of your barrel before loading or even before buying bullets. Several rifles, among them 30-30-303 British, 32-40 and 38-55 are larger by one or two thousandths in bore than their factory bullets. The ballistic figures were obtained with such ammunition. Full-sized bullets will give *higher* pressures.

Be finical and exacting about the cases you use for this purpose. Refuse all wartime cases, and all old ones or badly corroded ones. Modern ultra-pressures have about reached the limits of brass cartridge cases as they are newly made at the factories. When wrongly tempered or in any way weakened they not only set back or split excessively, but may blow out at the head, endangering the shooter's eyes and possibly wrecking the action of the gun. These poor cases may do for reduced loads, but ultra-loads should be put into new cases or those known to be made of proper alloy, properly tempered, and less than three or four years old. The best cartridge cases ever made in this country are the 30-1906 Frankford Arsenal product of 1922 and 1923, intended for National Match use.

In other calibers the cases offer more of a problem, and this is particularly true of late years regarding the 45-70, 44-40, 38-40 and 32-20 cases and even of 38-55 and 32-40 cases. Such cases are much thinner to begin with. A little corrosion weakens them until they buckle when you seat the bullet. Crimping them is hard to accomplish without distorting the walls. They of course will set back, split or burst at the head much more often than the heavy 30-caliber cases.

Altogether, the handloader who attempts to prepare ultra-loads for such calibers will find the proposition more exacting and ticklish than in the bolt-gun cartridges. He will be more abruptly limited in stopping place with any combination of powder and bullet. The individual peculiarities of his gun will have greater effect. It takes an observing and intelligent worker to obtain maximum velocity from the 30-30 without making his cartridges stick in the chamber of the gun, for instance. One reason is that these strictly sporting bullets and cases, and rifles as well, vary more than the military calibers. In the event that your fired cases give too much trouble, try buying new primed ones. They are not so expensive in the small sizes.

In previous chapters the matter of powder makers' lots of any one brand was explained. Watch that. Government pyro powder, for instance, is supposed to be the same as Du Pont No. 20, and it is—but only in standard lots. You may have or may get a lot giving the desired pressure with

45 grain charges instead of 48; or again your lot may require charges of 50 grains.

Smokeless powders deteriorate from the mill standard as they are shipped and handled and as time passes. There is a lesson for riflemen in the manner in which smokeless powder charges for big guns are handled. When, after a few years' storage, tests of prepared ammunition show it to have departed from the set standard of velocity and pressure, it is taken apart, the powder is "blended" again—that is, screened and mixed thoroughly—the correct charge required to produce the standard velocity and pressure is determined anew, and then the powder is loaded back into its bags or cases ready for firing. It is as good as ever, but the charge is different.

Your rifle powder also may accumulate dust among the grains, from corners rubbed off or broken, and it may get damper or drier than when it was tested and put in canisters at the mill. Powder dust will make the charge burn faster, much faster, and make it develop higher pressure. Moisture in excess will make it burn slower and make it develop less velocity. For ultra-loads, it is best to shake your powder gently in a screen, to remove dust from it.

One homely little detail of great importance is the funnel which leads the powder into the case. If it catches a few grains even for an instant, it will upset all your careful calculations, and may be the means of wrecking your gun. The same applies to the tube of the powder measure.

Whether the powder charge completely fills the case or leaves an air space and rattles when shaken, is not greatly important, except as compared to the same load in a new case. A case fully expanded and clean of all powder fouling and corrosion will have more room inside and will shoot any particular charge with less pressure than a case fully resized, or with an accumulation of dirt on its inner walls. The difference may amount to thousands of pounds.

Seating of the bullet is another factor in regulating pressure. This matter, however, is so related to the shape and hardness of the bullet that it will be taken up separately in a later chapter. For ultra-loads you must make sure that your bullets are identical with those used by ballistic stations in determining the pressures given in the tables. If they differ, pressures will differ. You can use other bullets, of course, but only by allowing in your powder charge for their length of bearing, their diameter and their weight, increasing powder charges for bullets giving less resistance, and decreasing for more resistance. Beware of bad lots of jacketed bullets, made of poor alloys, made in worn dies, or irregular in size and weight. If you have any such, use them for reduced loads.

Another source of excess pressure lies in badly fouled barrels. It is possible for enough metal fouling to accumulate in a barrel to raise the pressure of the car-

tridges fired in it by 20 per cent or more. Ultra-loads should not be used in badly worn rifles, either. The bolts and locking lugs may be set back or may be crystallized, or actual cracks may be started. Everything about the gun should be clean and in first-class order when maximum loads are fired.

Do not use loads in rifles of another class. For instance, 30-40 loads for the Krag must be lighter than for Winchester rifles, and 303 British loads for the Enfield rifles must be lighter than for 303 Ross. Never attempt to switch heavy loads for one cartridge to another, even if the two look to be identical, there is some good reason for keeping them separate.

As an illustration of the effect of quick twist in building up pressure of a load, the 25-35 Winchester rifle has an 8-inch twist, to handle its 117-grain bullet point on, while the 230-3000 Savage has a 12-inch twist, as is permitted by the 87-grain bullet. Certain special rifles have been chambered for the

CORRECTION—JAN. 1 TABLE OF LOADS

In the installment of Handloading Ammunition published on January 1, 1923, the table of loads should be corrected as follows:

The Remarks column lacks one line of type from about its center, opposite and belonging to the load for 25-35 rifle consisting of 100-grain Western Lubaloy bullet, Du Pont No. 18 powder, charge 26.3 grains, velocity 2,339 f. s. and pressure 32,000 pounds.

All Remarks below this load are correctly in line with their proper loads, but the Remarks above this item are shifted downward. Each line of type, therefore, belongs to the load next above it, upward to the top, where load lines and Remarks lines are more nearly opposite.

23-35 case, but with twists of 10 inches or 12 inches, and they will invariably handle one or two grains more powder than the Winchester while giving the same pressures. The 45-90 cartridge is really a black powder ultra on the 45-70 base, with bullet reduced from 500 to 300 grains in order to obtain speed, and twist of rifling decreased from one turn in 20 inches to one turn in 32 inches to keep down pressure.

Maximum loads in the black powder rifles are really not much or any beyond the capacity of solid alloy bullets fitted with gas-check cups to prevent smokeless powder gases from fusing their bases. When a short, blunt bullet is driven faster than 1,600 to 1,800 feet, its flight becomes erratic, consequently the ultra with this type of cartridge lies at about those figures, even though jacketed bullets are used. As the bullets lengthen in proportion to diameter, they fly steadier and maintain their ranging power better. Round-nosed bullets of good length, like

the 220-grain 30 caliber one, do well up to 2,300 feet velocity. At about that point, however, air resistance becomes so serious against the blunt point that any temporary advantage gained by greater speed is lost within a short distance. The ultra-load with the round-nosed bullet therefore usually stops at about 2,200 feet.

Sharp-pointed bullets meet the air with so much less friction that they hold the advantages of higher velocities up to about 3,100 feet, maintaining ranging power somewhat in proportion to initial speed. Beyond about 3,000 feet velocity, however, the head resistance and the pull of the vacuum on their bases is increasingly effective in causing them to fall off in power, so that there is no particular object in driving them faster. Savage 250 bullets of 87 grains weight can be driven at 3,250 feet so far as chamber pressure is concerned, for instance, but at the 300 or 500-yard points such speeded bullets are traveling little faster than others started at 3,000 feet, while the 100-grain bullet starting at 2,860 feet velocity actually catches up with them by and by.

Boat-tail bases have been introduced in order to avoid part of the retarding effect of the air, thus not only increasing the ultra velocity limit, but giving a bullet at any velocity better ranging capacity. The ultra-load, therefore, is not necessarily the speediest one. It is the one which gives flattest trajectory and longest "danger zone" with any particular sight setting; the one with least time of bullet flight over long range, thus escaping in some degree causes of inaccuracy such as wind drift, and requiring less head-lead on moving game; the one with utmost penetration and shocking power, and consequently most killing power. A handloader has wonderful opportunities for outclassing standard ammunition in this direction. The next few years will undoubtedly witness a very material change in the design of American bullets, especially those used for long-range target and military shooting. The widespread interest now existing in the boat-tail bullet will result in numberless individual experiments and practical applications of this profile.

It is a question whether the application of the boat-tail base to any but high-velocity, metal-cased bullets is practical as the pronounced advantages of this type base are only apparent over the latter part of the projectiles' flight. At ranges under approximately 1,500 yards there is no marked advantage to be gained from a sporting standpoint. However, it is interesting to speculate as to what results may be obtained by placing the boat-tail base on those of our lead and alloy bullets which at present are only effective at ranges under 500 yards.

It is entirely possible that the application of such a principle will result in doubling the range of these projectiles, which in effect will place many of our black powder cartridges near the "ultra" class.

Ballistic Jurisprudence

(Continued from page 4)

It is not necessary to go into details of the writer's testimony, for any kindergarten rifleman who has progressed to the stage where he can load a Springfield with a clip of five cartridges could tear this sort of testimony into shreds.

Suffice it to say accused was acquitted and to cap the climax said expert hunted me up and facetiously advised me he couldn't see where his testimony and mine differed materially, and showed me a clipping from a Portland paper to the effect that a man there had been convicted on quite similar testimony.

Now whether the defendant was guilty or not, and I have my own opinions in the case, is neither here nor there, but the heinous testimony of an individual who has lead the court and jury to believe he is an expert in his line, and accepting a large stipend for such supposedly expert testimony is a crime in no wise less than the one of which the defendant was accused.

"Thou shalt not kill," and "Thou shalt not bear false witness" are two of the Ten Commandments, neither may be broken with impunity.

From my own personal knowledge of machine-shop practice and from results of experiments with recovered bullets I am making the statement here and now, that in my opinion no man is justified in swearing on the witness stand that any certain bullet had been fired from any certain gun where he has not seen that gun fired and recovered that bullet himself or observed its recovery. This under the most favorable circumstances for the recovery of bullets with minimum deformation, and much less so where the said bullet has passed through the clothing and body of a man and perhaps through bones.

I further make this statement: I firmly believe an expert having proper high-power microscope and micrometer calipers reading to at least one thousandth part of one inch can with definiteness swear a certain bullet, having the minimum deformations, was NOT fired from a given gun.

I base my assumptions on the following facts: Switching the scene to a factory where barrels are manufactured (not cast in moulds) we will take ten barrels rough bored but not rifled. Suppose, for example, Barrel No. 1 is rifled with a rifling cutter just freshly honed and sharp. The cutting edge of this rifling cutter, while appearing to the naked eye to be smooth, is actually similar to a saw edge if we examine it under a microscope. It has little hills and little hollows, each of which makes impression after its own kind in the steel when it is forced through the barrel. So barrel No. 1 is rifled with this cutter. It is assembled into a complete rifle, loaded with a ball cartridge and fired. The bullet fired from this barrel, if it be a tight fit as it should be, bears marks corresponding in detail to every groove or hummock left in the barrel by that rifling cutter, and on comparing two bullets fired

from this barrel the same patterns will be found on each, therefore it would appear as though a certainty that the two bullets must have been fired from the same barrel. But wait. Let's see barrel No. 2. The operator on examining the cutter observes it to be in good condition so proceeds to rifle barrel No. 2 with the same cutter bar. Now supposing these two barrels to be of the same inside diameter, as may readily occur, who is he that can say with certainty which of those two barrels fired a given bullet! Supposing that same cutter rifled all ten of these barrels before it was again honed, thus making a new design on its edge. A brave man is he who can go on the witness stand and swear which of these barrels fired a certain bullet.

On the other hand, if these groovings on a bullet do not correspond to the ones on a bullet known to have been fired from a given barrel I believe one would be justified in swearing to that fact.

There is one exception to our rule of which mention might be made here. Given a barrel which has met with an accident and a burr thrown up on the muzzle in such a manner as to make a very decided mark on a bullet passing through the barrel. Under a microscope I do believe a bullet could be identified by the groove corresponding in detail to the burr in the barrel. However, such a contingency is very rare, and as I say, is the exception to the general rule.

I have also had the matter of a pitted barrel brought up, but I fail to see where such a condition would alter the general status in the least unless the lands were pretty well eaten out, in which event it would be more difficult than the identification of a bullet fired from a brand new barrel.

And in the event that the barrel had been lapped out at the factory to a fine bright mirror-like finish we have again lessened our likelihood of identification.

I do not make these statements as absolute, but give them as my own opinions and if any of our readers have any better information on the subject I for one would be glad to see the subject fully aired in these columns. Let all of us post ourselves on this subject so that if occasion arises whereby the life of an individual is at stake we can with definiteness give testimony that will either convict him or acquit him by a clear-cut statement of truths and not by a half-dozen snap judgments.

The alienist has his well-defined field and the psychologist is making great strides in his profession, so why not the professional firearms and ammunition expert, since according to the American Bar Association, 90 per cent of crime is committed with or by means of firearms, and where would be the most likely place to find the expert in this line if not from among the ranks of the National Rifle Association and the readers of this and similar magazines where the latest developments on the subject are continually being brought up.

Later on when all privately owned firearms have been destroyed and no one except the police and Army is permitted to possess the lethal instruments, and when 90 per cent of the crimes are committed with and by means of lead pipe, then our firearms and ammunition experts, if they can read the writing on the wall, can prepare themselves as lead-pipe experts, which, as Ring Lardner would probably say, "Should ought to be a cinch."

"Crooked Shooting"

By Ellerton James

REFERRING to your editorial on "Crooked Shooting," I think there can be no question that the bulk of the records are honest and the explanation of these apparently wonderful records is the one you give.

Take my own case for instance, when I was a boy twelve years old, I spent practically all my summers shooting English sparrows with a .22 rifle, with a range anywhere from ten to twenty yards. I shot altogether somewhere like six hundred sparrows in the summer. I got one cent each, so I know.

To see if my rifle was accurately sighted, I used to try shooting at a nail-head in a high board fence, about thirty or forty feet from the barn window, and if I couldn't hit the nail-head at least fifty per cent of the time, there was something the matter with me or the rifle, and I don't think I ever came more than a quarter of an inch, or at the most, a half an inch from that nail-head. I used a Lyman rear peep-sight and a Lyman bead foresight and C. B. caps, and most of my shooting was done sitting down, firing through the barn door, or with the rifle rest-

ing on a window ledge. Now, I am pretty confident that, given a modern .22 rifle, fine sights and proved ammunition, I could, if I shot as much as I did in those days, put up some wonderful records on ordinary small-bore target; there must be hundreds and thousands of boys throughout the country who are in the same position that I was.

As you justly say in that kind of shooting, nothing but a bull's-eye counts, and you get to a place where you put everything pretty close to the bull's-eye. I know no better training for any kind of shooting.

Showing what a perfectly green man can do, it has just come to me that in my camp at Plattsburg, in 1916, the man of the whole outfit who made the best score on the range, and it was a whale of a score at that, though I have now forgotten the figures, had never fired a rifle until he came up to that camp, but he had a naturally good eye, very steady hands, and did as he was told, so the fact that men who have never been heard of before make record scores is no reason for supposing those scores crooked.

Individual Instruction in Rifle Practice

(Continued from page 9)

the slack, the correct manner of holding the breath, aiming and the use of the aiming device.

10. *Blackening the sights.*—In all preparatory exercises involving aiming and in all range firing, both sights of the rifle will be blackened. The blackening is done by holding each sight for a few seconds in the point of a small flame which is one of such a nature that a smooth uniform coating of lamp black will be deposited on the metal. There are a number of materials which give a flame of the right nature for this purpose. Among the most commonly used are: A candle, a piece of camphor, a wax match, a piece of pine wood full of pitch, a small piece of shoe paste, a rag saturated with any kind of oil. Some device must be provided to protect the flame from the wind.

11. *The gun sling.* a. The gun sling is of great assistance in shooting. It helps to steady the rifle, presses the butt of the rifle against the shoulder with the same amount of force for each shot and reduces the effect of the recoil.

b. Each man will be assisted by the instructor in adjusting his sling, which will be habitually carried with this adjustment. The



Fig. A



Fig. B



Fig. C

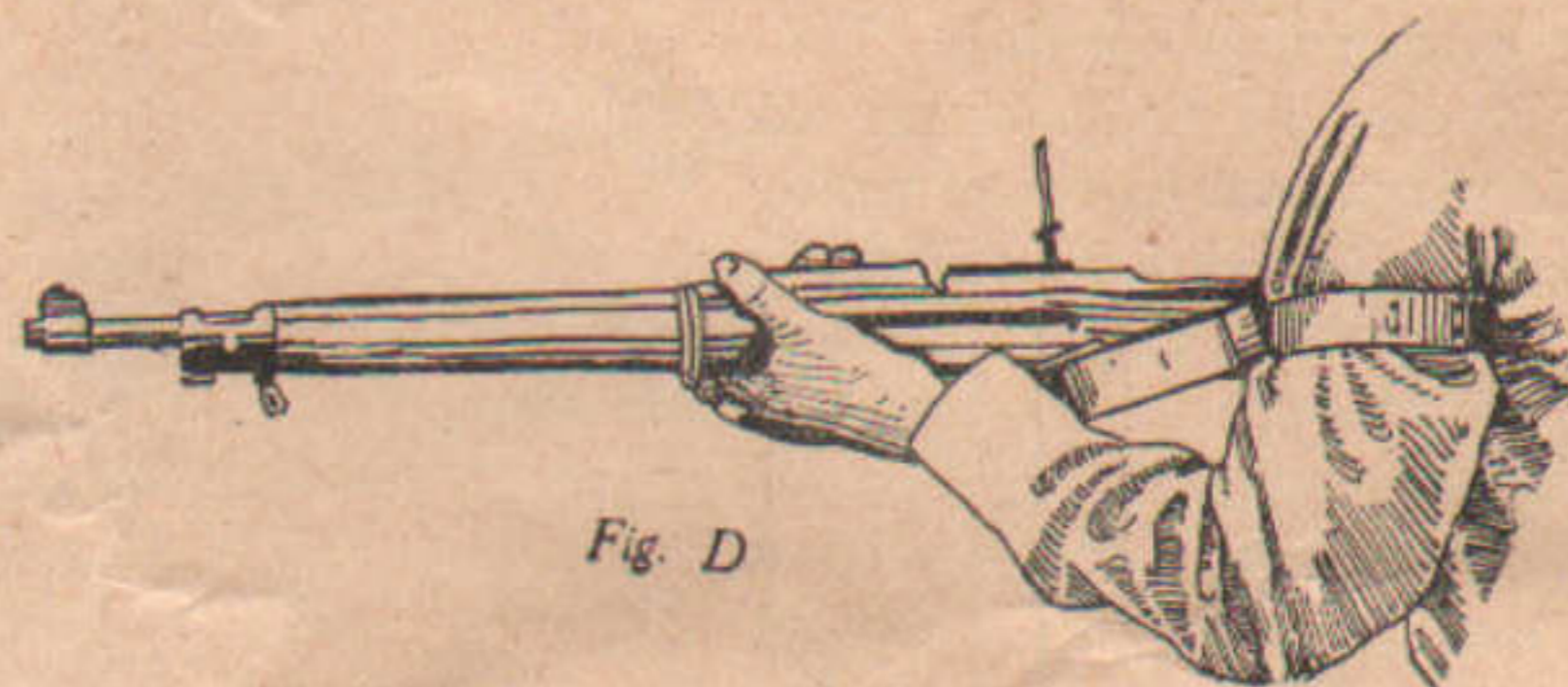


Fig. D

Plate No. 5.
The loop adjustment of the sling



Fig. A



Fig. B



Fig. C

Plate No. 6
The hasty sling adjustment

gun sling will be tightened by means of the lower loop for drill or parade purposes without changing the adjustment of the upper loop. In a firing position, the sling should be as tight as it can be made and still allow the man to get into it readily. A properly adjusted sling will feel uncomfortable until the muscles of the arm become accustomed to the pressure.

c. There are two authorized methods of adjusting the sling—the “loop” adjustment and the “hasty sling” adjustment. The “hasty” sling is more rapidly adjusted than the “loop” sling, but it gives less support in positions other than the standing position. In range firing the “loop” sling will be used at all ranges, except 200 yards standing. The “hasty” sling will be used on the range in the standing position at 200 yards. Instruction will be given in both sling adjustments. All men will be required to use one or the other form of gun sling adjustment when firing or simulating fire in all problems and maneuvers.

(1) The loop adjustment. (See Plate V.)

(a) Loosen lower loop.

(b) Put left arm through upper loop from right to left so that the upper loop is near the shoulder and well above the biceps muscle.

(c) Pull leather keeper down so that it will hold the upper loop in place.

(d) Move the left-hand over the top of the gun sling and grasp the rifle near the lower band swivel so as to cause the sling to lie smoothly along the hand and wrist.

(e) Lower loop, not used in this adjustment, will be so loose as to prevent any pull upon it.

(2) The "hasty" sling adjustment. (See Plate VI.)

(a) Loosen the lower loop.

(b) Grasp the rifle just in rear of the lower band swivel with the left hand and grasp the small of the stock with the right hand. (Fig. A.)

(c) Throw the sling to the left and catch it above the elbow and high on the arm.

(d) Remove the left hand from the rifle, pass the left hand under the sling, then over the sling and regrasp the rifle with the left hand so as to cause the sling to lie along the hand and wrist.

The sling may be given one half turn to the left and then adjusted. This twisting causes the sling to lie smoothly along the hand and wrist.

12. *Taking up the slack.* The slack is the first movement of the trigger which takes place when light pressure is applied. Taking up the slack is part of the position exercise because this play must be taken up by the finger as soon as the correct position is assumed and before careful aiming is commenced. The entire amount of slack in the trigger is taken up by one firm pressure of the finger. If the slack is taken up by a slow gradual pressure, the pupil cannot know when the entire amount of slack has been taken up.

13. *Holding the breath.* a. Holding the breath in the proper manner, while aiming,

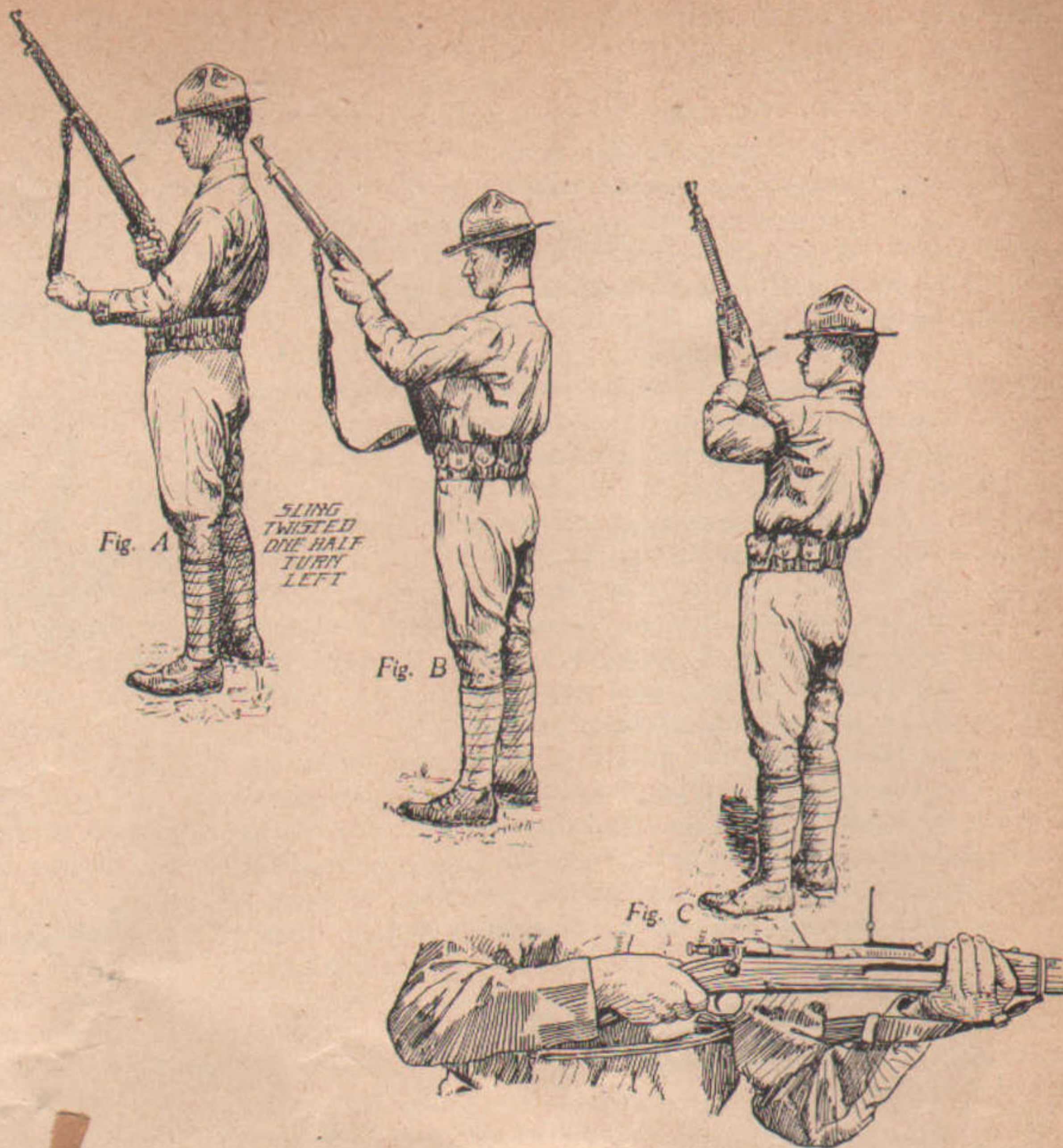


Plate No. 7
The hasty sling adjustment

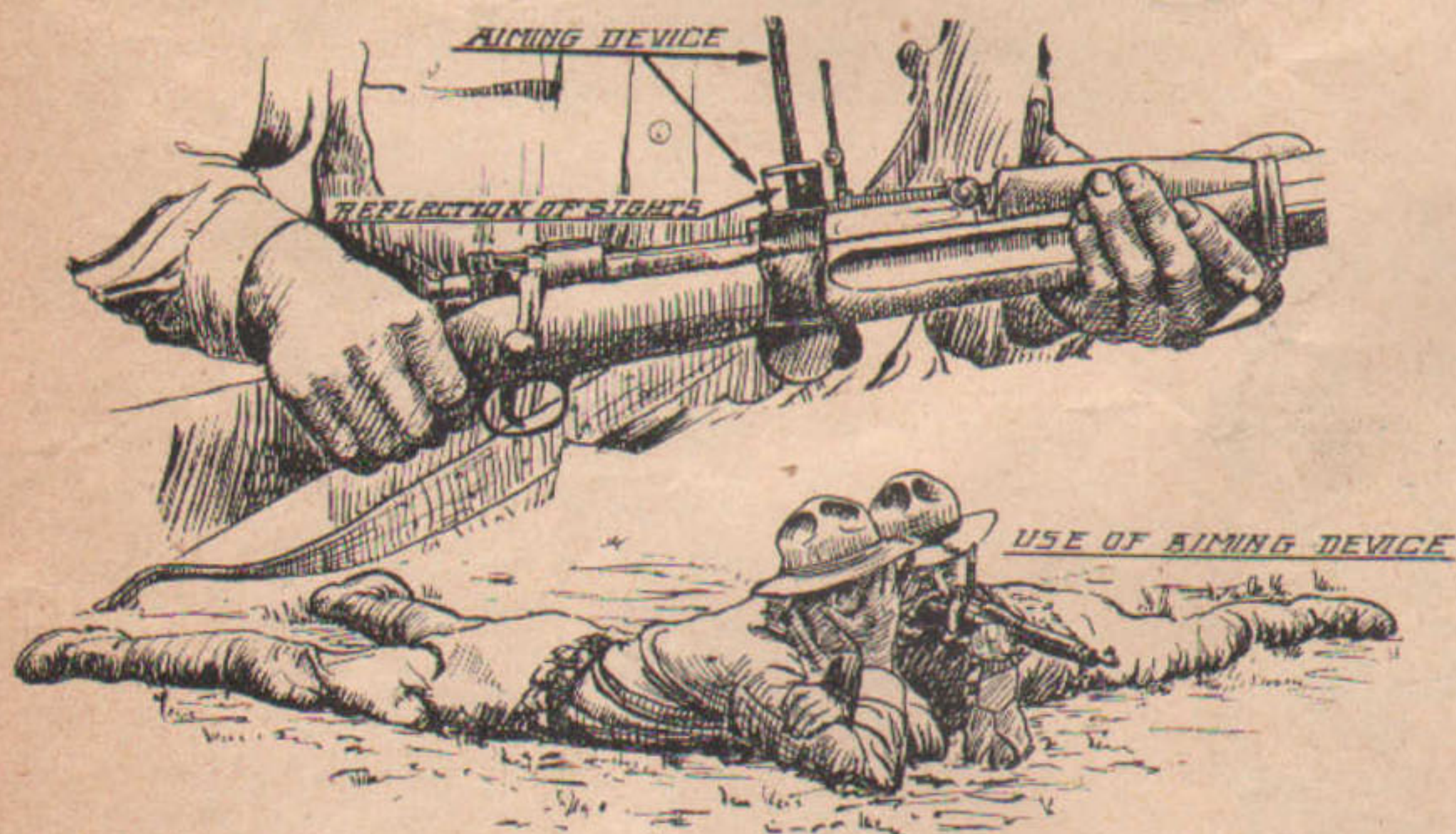


Plate No. 8

is very important. It will be found that a large proportion of men in any group undergoing instruction in rifle practice do not know how to hold the breath in the proper manner. Each man must be carefully instructed and tested on this point. The correct manner of holding the breath must be practiced at all times during position and trigger squeeze exercises and whenever firing or simulating fire.

b. To hold the breath properly, draw into the lungs a little more air than is used in an ordinary breath. Let out a little of this air and stop the rest by closing the throat, so that

the rest of the air in the lungs will press against the closed throat. Do not hold the breath with the throat open or by the muscular action of the diaphragm as if attempting to draw in more air. The important point is to be comfortable and steady while aiming and squeezing the trigger.

14. *The use of the aiming device.* (See Plate VIII.) This device will be used freely in the preparatory position, the trigger squeeze exercises and gallery practice so as to instruct the men in aiming and to correct errors. The device is a great help to the instructor in teaching men to shoot, both in

preparatory work and in range practice. It is principally used in the position and trigger squeeze exercises in the preparatory period. It cannot be used to advantage on the range when there is a poor light on the target. It can always be used to good advantage in the preparatory exercises because the small aiming bull's-eye is so close that the outlines are distinct and the target can always be so placed as to be clearly seen. (For the exact method of using the aiming device, see questions and answers, par. 53.)

15. *General rules for positions.*—The following general rules are common to the prone, sitting, kneeling and standing positions. They will be considered a part of each paragraph on positions and will be referred to when studying these paragraphs.

a. To assume any position, first half face to the right and then assume the position.

b. Upon assuming any position there is some point to which the rifle points naturally and without effort. If this point is not the center of the target, the whole body must be shifted so as to bring the target into proper alignment. Otherwise, the firer will be firing under a strain, because he will be pulling the rifle on the target by muscular effort for each shot.

c. The right hand grasps the small of the stock. The right thumb may be either around the small of the stock or along the right side of the stock. The position of the thumb will



Plate No. 9
Prone position

be such as to prevent injury to the face in firing. Most riflemen place the thumb along the right side of the stock.

d. The left hand is against or near the lower band swivel, the rifle resting in the palm of the left hand.

e. The left elbow will be as nearly under the rifle as it can be placed without appreciable effort.

f. The trigger should ordinarily be squeezed with the second joint of the index finger. The first joint may be used by men the length of whose arm or the size of whose hand is such as to make it difficult to reach the trigger with the second joint, or to whom the first joint of the finger seems more natural and comfortable.

g. The cheek is always pressed firmly against the stock and placed as far forward as possible without straining. It is desirable to have the eye as near as possible to the rear sight.

h. Left-handed men should be trained to shoot in the right-handed position. If this change is found to produce poor results in the case of any man, he will be allowed to shoot in the left-handed position. But he must be given additional preparatory rapid-fire practice to attain rapidity in working the bolt.

i. Men who cannot close the left eye may shoot in the left-handed position, but in practically all cases of this kind the man can, by practice, acquire the ability to close the left eye or to shoot with both eyes open.

16. *Prone position.* (See Plate IX). a. Body lying at an angle of 45 degrees to the line of aim with the spine straight; legs well apart; inside of the feet flat on the ground, or as nearly so as is possible without strain; elbows well under the body, so as to raise the chest off the ground; right hand grasping the small of the stock; left hand near the lower band swivel the rifle resting on the palm of the hand; cheek pressed firmly against the stock with the eye as near the cocking-piece as it can be placed without straining; gun sling properly adjusted and tight enough to give firm support.

b. The elbows should not be unduly spread

apart, because such separation results in an unsteady position and brings the chest so near the ground that the neck has to be strained backward in order to see through the sights. This strained position of the neck interferes with good vision and tends to make the firer unsteady. The exact angle of the arms to the ground will depend somewhat upon the conformation of the man. The right elbow should be so placed that the right upper arm will not form an angle of less than 45 degrees with the ground.

c. The exact position of the left hand will depend on the length of arm and width of

chest of the individual. It should be as near the lower band swivel as the conformation of the man will permit. The left hand will never be placed against, or near, the trigger guard.

d. A tight gun sling will feel uncomfortable until the muscles of the arm have become accustomed to the pressure. When the gun sling is properly adjusted, it is necessary to raise the right elbow from the ground in order to place the butt of the rifle against the shoulder readily.

17. *Sand-bag rest position* (see Plate X). a. The sand-bag rest position conforms in every detail to the normal prone position described in the preceding paragraph, with the addition of a sand-bag which supports the left forearm, wrist and hand.

b. The bag is a little more than half full and tied near the top, so as to leave considerable free space above the sand.



Plate No. 10
Prone position with sand bag rest

c. It is important that the sand-bag be high enough to permit the taking of the normal prone position. The natural tendency is to have a low rest and to be very flat on the ground with the elbows spread apart. This is a faulty position which causes lower scores than if no rest at all were used. The sand-bag when properly adjusted is a great help. When it is not properly adjusted it is a handicap.

d. The sand-bag rest position is used in the first stages of a pupil's training, not to teach steadiness of holding, but to teach the correct trigger squeeze. By using the

sand-bag the slight unsteadiness of the hold is avoided and the temptation to try to snap in the shot at the instant the sights touch the bull's-eye, an action which causes all poor shooting, is eliminated.

e. The coach will adjust the sand-bag as follows:

(1) Have the pupil assume the prone position and aim at the target.

(2) Set the sand-bag on its bottom and arrange the sand so that it is slightly higher than the back of the pupil's left hand.

(3) Facing the pupil, straddle the rifle barrel and slide the sand-bag against the pupil's left forearm, so that the narrow side of the bag supports his forearm and wrist and the back of his hand rests on top.

(4) Lower the sand-bag to the proper height by pounding it with the hand.

18. *Sitting position* (see Plate XI). a. The firer sits half faced to the right; feet well apart and well braced on the heels, which are dug slightly into the ground; body leaning well forward; both arms resting inside the legs and well braced; cheek pressed firmly against the stock and placed as far forward as possible without straining; left hand near the lower band swivel, the rifle resting on the palm of the hand.

b. The sitting position is used in the field when firing from ground that slopes down-

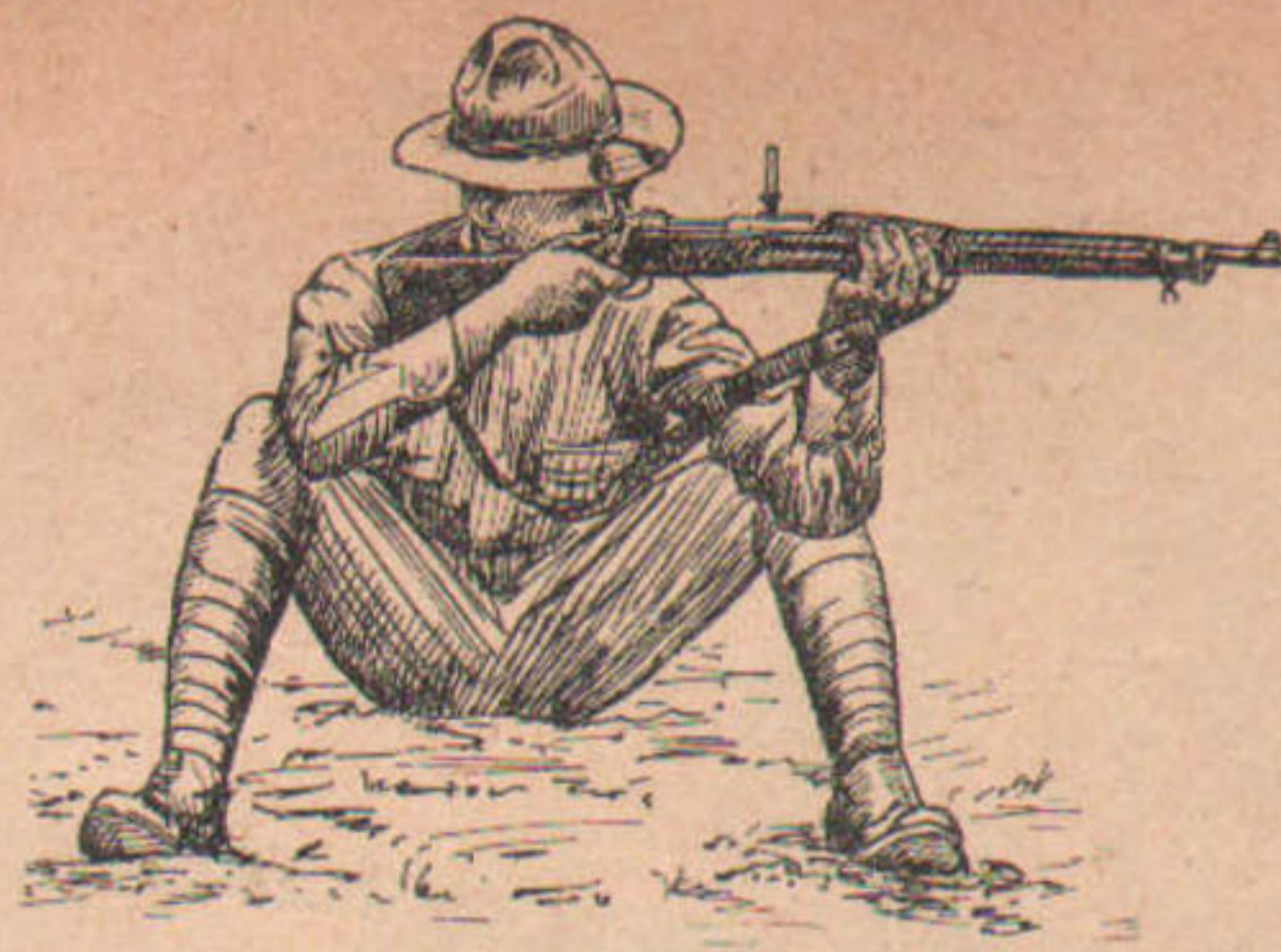


Plate No. 11
Sitting position

ward at the front. In practicing this position, the feet may be slightly lower than the ground upon which the pupil sits. Sitting on a low sand-bag is authorized.

19. *Kneeling position* (see Plate XII). a. The firer kneels half faced to the right on the right knee, and sitting on the right heel; the left knee bent so that the left lower leg is vertical; left arm well under the rifle and resting on the left knee with the point of the elbow beyond the knee cap; right elbow approximately at the height of the shoulder; cheek pressed firmly against the stock and placed as far forward as possible without strain. Sitting on the side of the foot instead of the heel is authorized.

20. *Standing position* (see Plate XIII). a. The firer stands half faced to the right; feet from one to two feet apart; body erect and well balanced; left elbow well under the rifle; left hand grasping the piece in front of the balance; rifle resting on the palm of the left hand which grasps the piece in front of the balance; butt of the piece high up on the shoulder and firmly held; right elbow approximately at the height of the shoulder; cheek pressed against the stock and placed as far forward as possible without strain. A position with the left hand against or under the trigger guard and with the left upper arm supported against the body, is not a practical field position and is prohibited.

(Note.—Plates 12 and 13 will appear in the next installment.)

(To be continued)

New Arms Company Formed

IT will soon be possible for American sportsmen to procure in the United States the high-grade specially-made class of guns upon which we have been almost entirely dependent on England and France, with assurance that in quality, workmanship and accomplishment they will be the peer of anything it is now possible to purchase abroad.

The Hoffman Arms Company has been incorporated and adequately financed, and is now opening a factory in Cleveland for the purpose of manufacturing specially ordered guns of the highest type. No quantity production will be undertaken, but it will be possible for the American sportsman to obtain any type of gun made to whatever specifications he designates—high-powered rifles, match rifles, sporting rifles of all sizes, etc.

The United States has set the pace for the world in quantity gun production, but that form of specialized manufacture in which the Hoffman Company will engage has been left to individuals scattered throughout the country where love of craftsmanship has resulted in workmanship of very high degree. However, this has been unsatisfactory, largely on account of lack of dependability. When the craftsman died, his particular phase of excellence in manufacture died with him. The Hoffman Company is selecting a number of these craftsmen and affiliating them with its company, so that a permanent and dependable organization will result.

Production will be under the supervision of Mr. Frank L. Hoffman, vice president, in charge of this carefully selected force. Only the best materials are to be used, and every gun turned out will be with the personal supervision of Mr. Hoffman and delivered under rigid guarantee.

Mr. Hoffman is exceptionally qualified for the position he holds. His name will be generally known to sportsmen everywhere. He has hunted big game all over the world, while his proficiency on the range won some of the great national matches. In addition to making and stocking fine guns, he has a deserved reputation as a ballistecian. He will do all designing for the company, and his personal experience in big game hunting has made him an authority on the requirements of guns needed for the various branches of this sport.

Notwithstanding America's superiority in most lines of manufacture, several thousand specially made guns are imported into the United States from England and France each year by sportsmen who desire specially made guns of the highest type. It has been impossible to procure them here except from isolated individual gunmakers, who are liable to have died or moved by the time repairs or duplication is desired.

Harry Snyder, of Cleveland, is president of the Hoffman Arms Company, and Guy A. Spencer, of Washington, is secretary-treasurer. The company's business office is lo-

cated at 610 National City Building, Cleveland, Ohio, with Mr. James L. Stephens in charge.

Falling Bullets

(Continued from page 8)

mounting the gun in the Daytona tests is shown in Figure 1. The gun with armor plate head cover was located over one of the observation bomb-proof dugouts ordinarily used in horizontal firing.

The first surprise encountered on Daytona Beach was that the first tests attempted resulted in nothing ever being heard of the bullets after they disappeared heavenward. As a result, it was necessary to resort to the use of pilot balloon flights. By the use of a great many of these balloons it was possible to have a graphic picture of just what was taking place in the upper air currents at any moment and estimate the correct angle to lay the gun in order that the bullets would return near enough to be heard and later found.

The pilot balloons showed that in the majority of cases the winds at high altitudes were nearly always reversed from their direction on the surface and that it was necessary to lay the gun nearly in the opposite quarter from that required by the surface winds. By this means the tests became more successful and a number of bullets were recovered.

Figure 2 shows the service bullet as it returned after being fired vertically upward.

It will be noted that it returned base first although wobbling considerably, and its penetration in the hard sand of the beach is only about one-half of its own length which certainly does not speak well for either its velocity or effectiveness. This bullet returned fairly close to the gun.

Figure 3 on the other hand is a similar test in which the same bullet was used but which landed at a considerable distance from the gun and it will be noted that it has landed squarely on its side, thus showing that it was just about at the critical angle already referred to.

Figure 4 shows the hole in the hard sand of the beach made by a returning boat-tail bullet which is rather conclusive evidence of the force with which it returned.

The following table shows the vertical time of flight for various types of weapons as determined at Miami and Daytona, Fla.:

SUMMARY OF VERTICAL TIME OF FLIGHT FOR VARIOUS TYPES OF SMALL ARMS AMMUNITION.	
Ammunition	Mean Time of Flight
Caliber .30 Model 1906 (Service):	
Fired from Browning Machine Gun	49 to 51 seconds
Fired from Heavy Barrel in Mann Rest	61 seconds
Model 1919, Boat Tail Bullet, 175 grains, Muzzle Velocity 2,600 feet per second: (Fired from Browning Machine Gun.)	
Main Group	1 min., 46.5 secs.
Abnormal Group	1 min., 6.0 secs.
French Service Bullet, 195 grain, Muzzle Velocity 2,380 f. s., fired in Lebel Rifle	1 min., 11 secs.
Swiss Service Bullet, 175 grain, Muzzle Velocity 2,660 f. s., fired in Swiss Rifle	1 min., 3 secs.
Service Bullet, loaded reversed (point down) in case	31.4 secs.
Model 1919 Bullet, loaded reversed in case	20.9 secs.
180 grain "Palma Match" Cartridge, Muzzle Velocity 2,700 f. s.	57.0 secs.
"Guard Cartridge" Service Bullet, Muzzle Velocity, 1,200 f. s.	40.8 secs.
30-30 Sporting Bullet, 160 grain, blunt nose, Muzzle Velocity 2,600 f. s.	50.4 secs.
Remington "Pencil Point" Match Bullet, 172 grains, Muzzle Velocity 2,600 f. s.	51.4 secs.
Remington .35 Auto-Loading Rifle, Bullet 200 grains, Muzzle Velocity 2,020 f. s.	57.3 secs.
Caliber .22 Long Rifle Lesmok, Bullet 40 grains, Muzzle Velocity 1,050 f. s.	35.6 secs.
Model 1911, Caliber .45 Automatic Pistol, Bullet 230 grains, Muzzle Velocity 800 f. s.	39.0 secs.

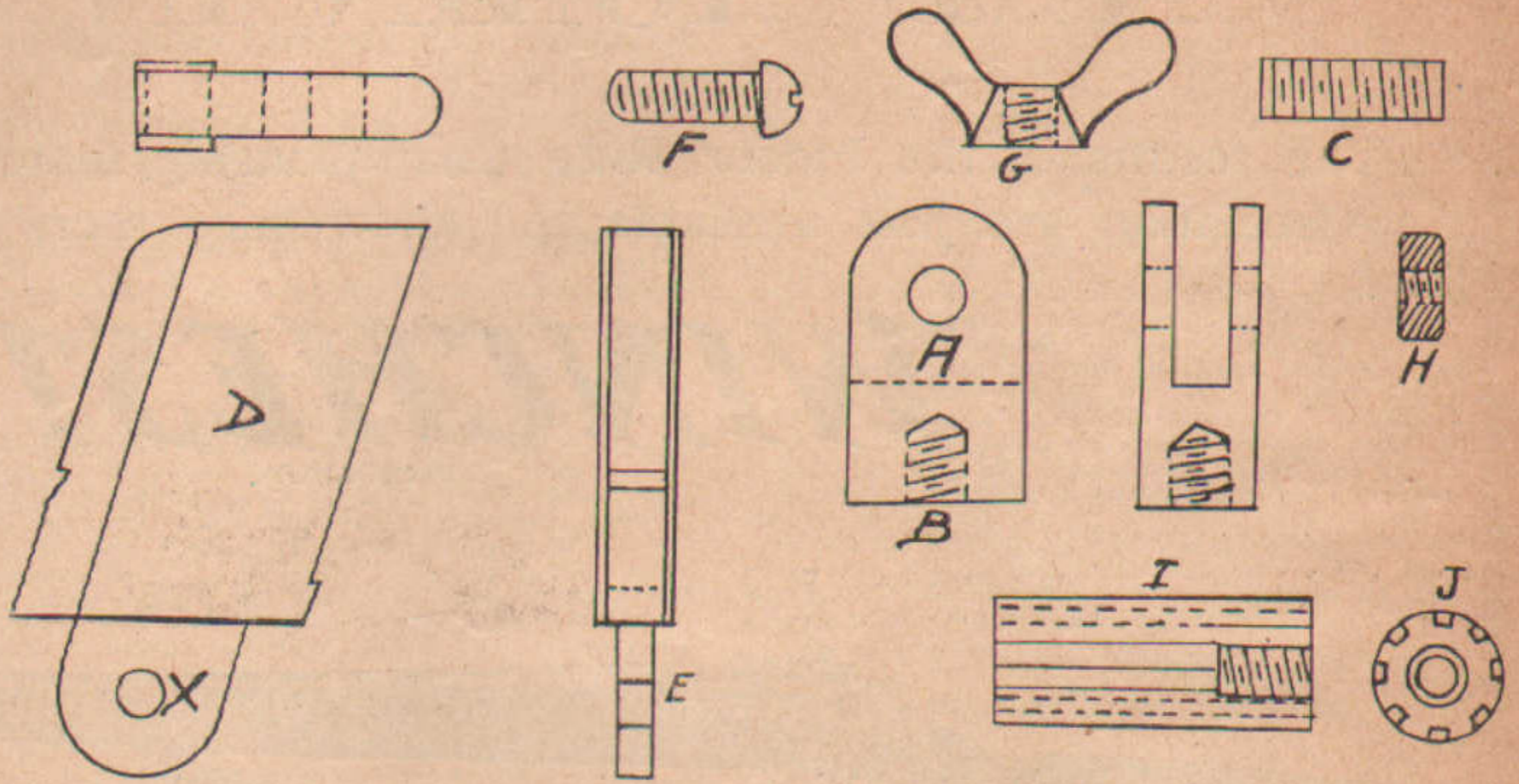
(Note.—This is the average time it takes the bullet to pass from the muzzle of the gun vertically upward and return to earth.)

Based upon various foreign calculations as to the duration of time that the bullet occupies in various portions of the path in its upward flight and the height to which it ascends the following estimate is made for the service bullet. The service bullet probably ascends to about 9,000 feet, requiring about 20 seconds to ascend and about 35 seconds to descend. The bullet probably descends the last 6,000 feet at a nearly constant velocity of about 300 feet per second, as the bullet is subject to increasing resistance to its motion due to the fact that the density of the air increases as the surface of the earth is approached. Otherwise the velocity of the bullet would continue to increase due to the effect of gravity.

It is therefore quite easy to see why it is so hard to observe the return of bullets which have been fired straight up, as the bullet must spend something like seventeen or eighteen

A Palm Rest for the 22 Springfield

By W. C. Wilson



THOSE brother shooters who possess a .22 Springfield and expect to use the same in the N. R. A. Small Bore Free Rifle Matches the sketch above will furnish a means of having a perfect palm rest without drilling any holes in the action or marring the gun in any way.

D is a false magazine to which hinge A is fastened at X with the screw F and wing-nut G. Stud C is screwed into hinge A at B. I is a long nut which has a series of slots out lengthwise of the body, these slots enable the nut to be set in a cork ball with sealingwax and prevent its turning. The cork ball with the nut I set in is adjustable on stud C and locked in position with knurled nut H. The false magazine D was made of brass to prevent any wear of the magazine well. The whole affair makes a very strong and durable palm rest, which may be adjusted for length and angle to suit the individual. By inserting a few .003" shims in the proper places, all play may be taken out of the magazine floor plate.

seconds on the way up at altitudes above 1,000 yards, while on the way down it similarly requires something like twenty or more seconds of time to reach an altitude of less than 1,000 yards. As has already been shown, the winds at altitudes above a few hundred yards are often reversed in direction from that of surface winds and meteorological reports show that the average winds at heights above 1,000 yards are around twice the velocity of the surface winds. Also the upper currents are often several times as strong so that when it is quite calm at the surface it may be very windy a few hundred yards up. This was shown time and again in the tests of horizontal firing at long ranges.

Certain conclusions may be drawn from these vertical firing tests which will be briefly stated as follows:

I. Bullets when fired straight up usually return with a slight hissing or humming noise. While in a vacuum they would return in the same path and with the same velocity they had when fired, actually the path is quite different and the velocity very low.

II. The striking energy of the falling service bullet appears to be only about half sufficient to cause a casualty. In fact the bullet will not bury itself in hard sand, it usually being found, point up, projecting from the sand and apparently having about the same penetrative ability

as it possesses at ranges on the horizontal from 2,800 yards to the end of its trajectory (3,300 yards).

III. When fired automatically from a machine gun, sometimes the bullets return in regular sequence, and at other times they bunch, several bullets falling at once. This, of course, is due to variations in the time of flight.

IV. A properly balanced bullet will return base first, showing that it retains its "spin."

V. Neglecting the effects of spin on the center of gravity, the shape, weight and muzzle velocity of small arms bullets apparently have a relatively small effect on the vertical time of flight, compared to the effect produced in horizontal firing.

VI. The coefficient of form (c) does not affect appreciably the time of flight.

VII. When the horizontal distance to the point of impact on the ground exceeds several hundred yards, bullets will be found to strike on their sides, and at greater distances will be pointed downward.

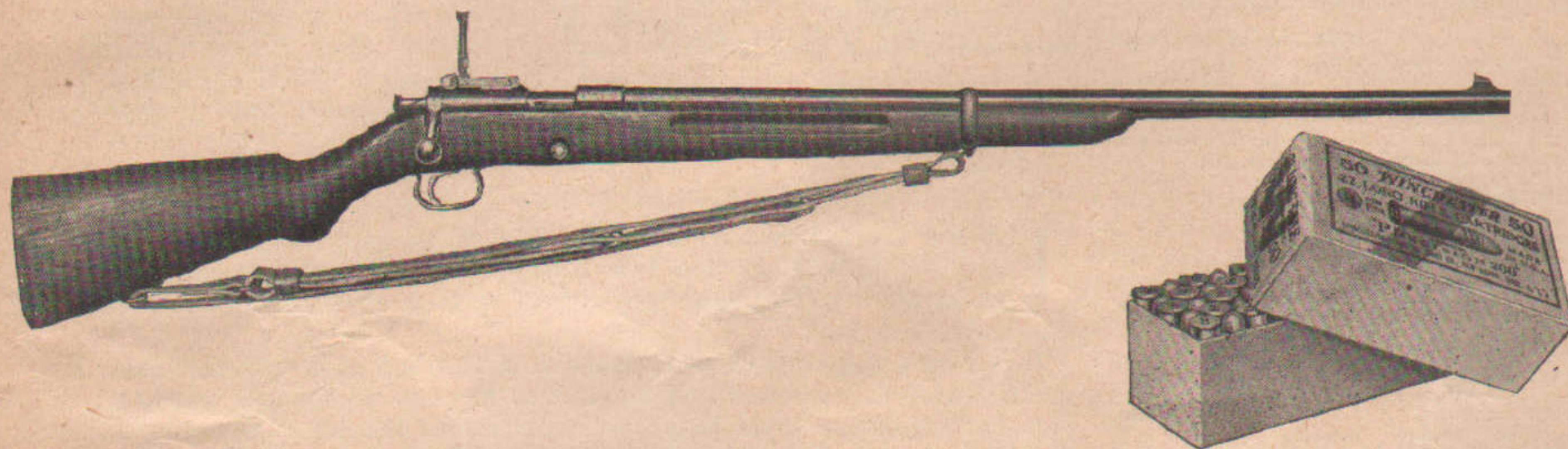
VIII. While the maximum vertical range for service ammunition is somewhere around three quarters of the maximum horizontal range yet the theoretical maximum vertical range at which fire can be effective is almost as great as the maximum effective range on the horizontal. Practically, however, it is doubtful if an aerial target can be effectively covered at ranges much in excess of 1,000 yards, if that much, due to the almost insurmountable difficulties of hitting such a target, even with machine guns.

AND AGAIN IN 1922-3

The results of the Indoor Rifle Championship matches of the National Rifle Association are just available and show once more the predominance of the

WINCHESTER

TRADE MARK



Model 52 and Precision Ammunition (made for each other)

50 Foot Team Championship

Seven out of eight winners used the Model 52, Precision Ammunition, or Winchester 5A sights.

50 Foot Individual Championship

Six out of seven winners used the Model 52, Precision Ammunition or Winchester sights.

75 Foot Team Championship

Four out of five winning teams used either wholly or partially, Precision Ammunition Winchester 5A sights, or the Model 52.

75 Foot Individual Championship

Five out of six winners used the Model 52, Precision Ammunition or 5A sights.

Why not get the maximum results from your skill by using this winning combination?

Write for full information to the

WINCHESTER REPEATING ARMS COMPANY
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"The Dope Bag"

A free service to target, big game and field shots, all questions being answered directly by mail.

Rifles and big game hunting: Maj. Townsend Whelen.

Pistols and Revolvers: Maj. J. S. Hatcher.

Shotguns and Field Shooting: Capt. Charles Askins.

Every care is used in collecting data for questions submitted, but no responsibility is assumed for any accidents which may occur.



AN INEXPENSIVE HUNT

I WANT to go on a moose hunt next fall and don't know where to go. I have owned and shot most every rifle and revolver made, but my '03 Springfield is my pet and I value it more than money itself. I got it in 1911, but it is just as though I had received it yesterday. Not a mar on it and only shot about 250 times and cleaned carefully every time.

I will get down to facts now and talk turkey. I will have about \$350 at the most to spend on my trip, besides my outfit, which I have. Now please give me full details where to go and what to take along. I also have a new '95 model carbine 30-06. Which should I take along, the Springfield as issued or the '95 Winchester? I want to put Lyman sights on both these guns. What shall I get? Shall I take: 30-06 Springfield or Winchester; 150-grain Lubaloy Western cartridge, hollow point, boat-tail, or 180-grain Lubaloy hollow-point boat-tail? How about expanding point. How many shall I take along altogether?

Regulation clip belt as issued, or leather, which? 1 supplemental chamber for .32 Colt cavalry auto.; 1 cleaning outfit. What do you recommend? 1 pocket knife; 1 skinning sheath knife. (Have 8 and 6-inch blades.) 1 pair 8-power binoculars; 1 small camera and films; 1 pair hunting shoes and hob nails.

Where can I get the little plugs for rifling and lands in the Springfield?

I want to stay two or three weeks and don't want to pay a guide \$15 a day. Where to go is the problem, and how to get there.

This information will be appreciated very much.

R. W. B., Buffalo, N. Y.

Answer (by Major Whelen): You bring up a subject in which I am greatly interested, that of showing our American riflemen, who are not blessed with an over-supply of worldly goods, just how they can have an inexpensive and successful trip for big game in the real wilderness. But I feel I can give this information only to those who can qualify for such a trip—who can find their way alone in a wilderness, can paddle a canoe, pack, build fires in the rain, cook, use an axe, etc. When a man goes into a wilderness with a light outfit, and without a guide he has got to carry a lot of information in his head, and got to know by experience how to do a lot of things. Your letter clearly indicates that you are not in this class.

But I want very much to help you out. My best advice would be for you to obtain a copy of Kephart's "Camping and Woodcraft" (two volumes). Any bookseller can get it. Study it. Then start out to learn to apply it by taking week-end camping trips near home. If you are enthusiastic, carry this through, and have a good bump of locality, you will soon be able to qualify for a wilderness hunt. Then come to me again and I will give you the information. I can easily tell from your letter if you can qualify or not.

I have for some time contemplated writing a series of articles on back pack and canoe trips after big game—how to do it, and where to go, but as yet I have been unable to find the necessary time. I know of a number of splendid localities where game is plentiful and where a rifleman, who is also a good woodsman, can easily pull off a successful hunt at a cost of only transportation, license and grub. But these would be impossible, in fact almost suicidal, for you with your present knowledge and experience.

I hope you will write me another letter in about six months. It would be a great pleasure to know that you cared enough for it to learn, and to qualify, and in such case I could certainly steer you straight to fine game country.

THE 8-MM. RIMMED CARTRIDGE

INFORMATION is desired about an Austrian army Mannlicher straight pull carbine. This gun has a mahogany stock and barrel length of about 19 1/2 inches from muzzle to where I think the primer rests. Caliber 8-mm. Shell has a rim; five to a clip; bullet mikes .321 and weighs about 242 or 245 grains. The ammunition is very expensive, as it is imported, and I only know one place in the United

States where I can get any, and this dealer's supply is very limited, and no more to be had when exhausted. Therefore I am undertaking to dig up dope enough to reload some of them and I am asking you for information concerning pressures, velocity, etc., so that I may not "tear my can off" in experimenting.

I load most of my own for rifle, shotgun and revolver, and understand reloading pretty well, but this is a foreign cartridge that I know nothing of, hence my yell for help.

There is, I think, a Sporting Mannlicher 8-mm. bullet made in this country, that weighs 236 grains, if my memory is correct, that I might use, but please tell me what velocity and pressure this gun is supposed to have normally and what powder and how much of it I should use, and if you know of any better bullet than the one I mentioned, and anything else that you may know about it that would be of use to me.

Might include the statement that this gun is marked STEYR, M 95 (which I take to mean model 1895) and evidently it was made in '17. The barrel seems perfect, rifling very deep, and it shoots very accurately, and for penetration I recently beat an NRA man's pet Springfield so bad there was no comparison, but I was shooting much heavier bullets with blunt points, which are said to penetrate wood better than spitzers.

Hoping you will be able to tell me what to reload with, I remain,

Yours for liberty to "Keep and bear arms,"

R. S., Los Angeles, Cal.

Answer (by Major Whelen): I have received your letter of January 13. So far as I know, no charges have ever been developed for the 8-mm. rimmed cartridge in this country, and I know of no pressure guns for it. Therefore, you will have to do original work without data as to pressures and velocities.

The old 236-grain 8-mm. bullets made in this country all measure .317 inch to .319 inch, and are probably too small for your bore. The only bullet that will be correct in size is the 170-grain jacketed bullet for the .32 Winchester Special cartridge, which measures .321 inch. But I do not know how this bullet will fit the throat of your chamber when seated in the case.

What kind of a primer does your case take? Unless it takes one of our primers you are halted right at the start because all steamship companies refuse to transport primers from abroad.

With the 170-grain .321 bullet, I would advise starting with about 35 grains of Du Pont No. 16 Powder, and working up a grain at a time, watching the primers, and measuring the diameter of the head of the cases (just in front of the rim) for indication of high pressure.

TEST ROOM QUALIFICATIONS

KNOWING of your wide experience in the firearms line, as well as your kindness in answering questions, I am taking the liberty to write you once more in connection with some difficulty I am having. Will you kindly answer the following at your earliest convenience?

What books and material would you advise a person to study if he desired to obtain a position in the test room of a government arsenal or with a private arms company?

What technical information is necessary to obtain a position of this kind? What schools, if any, would you recommend in which to obtain information of this kind?

What requisites must one have to obtain the position of Gun and Ammunition Editor of a magazine?

I am 19 years old, a graduate of High School and would like very much to earn my living along the gun and ammunition line. Any information which you think would help me will be very much appreciated.

S. W. C., Norwalk, Conn.

Answer (by Major Whelen): I have received your letter of January 4. The best books for your purpose would be:

"Ordnance and Gunnery," by Col. Tschappat, John Wiley & Sons, New York City;

"The American Rifle," by Major Whelen, "ARMS AND THE MAN," Washington, D. C., \$6.00;
 "The Modern Rifle," by Bevis, "Outdoor Life," 1824 Curtis Street, Denver, Colo. (On ballistics);
 "Cartridges and Loads for American Rifles," by Major Whelen, "ARMS AND THE MAN," free;
 "Handbook of the U. S. Rifle, Cal. .30, Model 1903," Superintendent of Public Documents, Washington, D. C. 40 cents;
 "Rifle Marksmanship," U. S. Infantry Association, Union Trust Building, Washington, D. C., \$1.00;

Catalogues of all arms and ammunition companies. The technical information necessary to obtain a position in a proof house or testing room is that contained in the above publications, and a knowledge of these would fit you very well theoretically. You would have had no experience, however, and would have to start at the bottom at probably 35 cents an hour. The highest paid men, excluding foremen and superintendents, get 55 to 60 cents an hour. I know of no schools to fit one for a position of this kind, but skill as a machinist is a big asset, and a night school which taught the machinist trade and draughting would be a big help.

To obtain a position as Gun and Ammunition Editor of a magazine requires almost a lifetime experience, say fifteen years at least. The man should have a reputation as an expert shot. He should have a wide acquaintance among shooters and also among the arms and ammunition trade. He should have some knowledge of journalism. He should be able to write.

If you have inclinations in this direction, I would advise you first of all to develop your ability as a shot, and to visit the Sea Girt and National Matches. Also join a rifle club and participate.

STANDARDIZATION IN THE 8-MM.

I HAVE taken the greatest interest in your articles now running in ARMS AND THE MAN, but have not yet seen anything for the 8-mm. cartridge, of which there are now, I believe, many over here. I would much like to know the best loads in that calibre for:

1. Deer shooting,
2. 200-yard shooting (target),
3. Short distances.

I think it is easy to get shells and bullets for this calibre, as well as the regular cartridge, and would like to know about loading them myself. Have loaded a great many of the American cartridges, including 405.

G. A. S., Plainfield, N. J.

Answer (by Major Whelen): Of all the rifles and cartridges I know of, the standardization in 8-mm. is the worst. Hardly any two rifles are bored and chambered alike. Literally hundreds of different cartridges in 8-mm. and 7.9-mm. have been made for these rifles. You may have a barrel bored small with long throat for 236-grain bullet, and you get rotten results when you try to use the large 154-grain bullet in it. If your rifle is chambered and rifled for the 154-grain bullet you either cannot insert a cartridge with 236-grain bullet, or if you can you get no accuracy at all. Between these two there are any number of combinations, equally rotten.

The Remington Arms Company have recently gotten out a new 8-mm. cartridge especially for these rifles. The bullet weighs 170 grains and muzzle velocity is 2,500 f.s. The bullet is made small and soft so it will expand and come near fitting most barrels and throats. It gives very fair results, and is decidedly the best cartridge to use. In fact it is the only one with any semblance of accuracy. I would decidedly advise against trying to reload for this rifle.

The best advice to give is to send your 8-mm. rifle to some good gunmaker and have him fit it with a good barrel for the .30 caliber Model 1906 cartridge.

PRIMERS AND EROSION

I HAVE noted that there is considerable improvement being made in the components of primers which is said to cut down erosion. As I have got to get a new supply and as they are hard to get in this part of the country, I am anxious to get what seems to be the best. I am especially interested in the following:

Primers for: .38 S&W Spec.; .45 Colt Rev.; .45 Colt Auto.; .25-20 SS.

Powders available: Semi-smokeless Bull's-eye No. 5; Semi-smokeless Schuetzen, No. 80, and others.

I am contemplating purchasing a set of Government reloading and would like to get such other supplies as are supplied from the same arsenal in order to cut down freight charges. The following things are of special interest to me:

Primers for any of the above cartridges; bullets for .45 Colt Revolver, .38 Colt OM, and .45 Auto.; new barrel for Krag carbine; smokeless powder for .38 and .45.

I have recently found out that some railroads charge at the first-class rate instead of double first-class on smokeless powder but double rate on black.

E. R. P., Norman, Okla.

Answer (by Major Whelen): No modern primers have any effect one way or the other on erosion. Some of the very old primers which contained ground glass may have had some such effect. Use the primers which the manufacturers recommend

for their cartridges and you will have little fault to find.

Of the cartridges you list, the only one for which you can obtain primers from the Government is the .45 Government Colt Automatic, and I think even in this case the primers will only fit these cartridge cases if they are of Frankford Arsenal make.

Primers, bullets (for Colt .45 Auto. only), smokeless powder, and reloading tools are supplied from Frankford Arsenal, Philadelphia, Pa. Barrels for the Krag Carbine come from Rock Island Arsenal, Illinois.

May I suggest that, owing to the transportation charges and packing charges on powder it may be cheaper for you to get it direct from the nearest Du Pont distributing point (magazine). Also Government reloading tools are not very satisfactory for individual use. They are better adapted to those who load in large quantities, and who have access to a machine shop to make the slight alterations in them often necessary for practical work. Better try one of the commercial tools, such as the Bond or Yankee.

Please also note that the Government does not furnish bullets for the .45 Colt revolver, or .38 Colt O. M.

THE REMINGTON .45 COLT CARTRIDGE

I RECENTLY purchased a box of Remington cartridges for the .45 Colt, plainly so marked both on the box and on the cartridges. I find that the cases of these cartridges are a quarter of an inch or more shorter than the cases used by Winchester and other people for the same cartridge and that, as a consequence, this Remington cartridge will not chamber properly in the Colt .45 Single Action Army revolver, failing to seat the edge of the case on the shoulder of the chamber by about the amount indicated above.

The dealer insists that this is not an experimental lot of cartridges allowed to slip into circulation, or a defective lot. He says that the shortened shell is part of the Remington process for "renovating" and speeding up this cartridge.

Before I make a claim on the Remington people, I am writing to confirm my impression that it is absolutely ruinous to any firearm to make a practice of shooting in it shells too short to chamber. I do not see how such procedure could fail to erode the exposed portion of the chamber and make extraction difficult or impossible when full-length shells are used.

A. W. M., Boston, Mass.

Answer (by Major Hatcher): It is true that the Remington make of .45 Colt cartridges are about an eighth of an inch shorter than the corresponding cartridges made by other firms. This cartridge was originally designed for a very heavy load (38 grains) of black powder, and when smokeless powder came into general use, it was found that not all of the space in the cartridge case was necessary for the smokeless charge. Some designers thought that better ballistic results could be obtained with a reduced powder space, which accounts for the shortening.

With low power loads, such as are found in revolvers, there is practically no erosion, and consequently no harm is done by shooting these cartridges in a revolver chambered for the regular length, provided that the arm is properly cleaned after using and is not allowed to rust at this point. I know of a .38 S&W revolver that has been fired upwards of 100,000 rounds, and it still does not show any perceptible results of erosion, and the accuracy is still first class. You will see, therefore, that it would take a lot of shooting to harm your revolver. The short shells will not do any harm. However, if you do not agree with the Remington engineers that they are better than the other style, you might change to another make in the future. I have never been able to detect any advantage one way or the other.

CAP-AND-BALL PRIMERS

I RECENTLY bought a fine .45 caliber cap-and-ball revolver with an 8-inch barrel. What I want to know is this: What is used for "primers" to touch the powder off and where can they be obtained? I took the bullet and black powder out of a standard .45 Colt cartridge and loaded half the powder and the bullet in a chamber of the cylinder and touched it off with a match, using black powder in the flash hole. It worked fine. The bullets, which were standard .45s, were too long to seat with the bullet seater under the barrel. Is there a shorter bullet which you think might work?

M. O. N., Portland, Ore.

Answer (by Major Hatcher): For primers on your cap-and-ball revolver, use the percussion caps sold for muzzle-loading guns. They can be purchased at the larger sporting goods houses, and also at country stores. I found no difficulty in purchasing a box yesterday for use on an old Kentucky rifle I recently acquired. There are several kinds made, for example, the trimmed edge caps, in sizes from 9 (smallest) to 14 (largest); the musket caps, which are only suitable for the arms with the larger nipple such as the old Government musket; and the "Colt Pistol" cap. You may have trouble buying the

"Colt Pistol" cap, which is the one you should have, as it is not likely that the local stores will have them; but you can certainly buy No. 9 caps, which may do, though it is a trifle large for the nipples on the revolver. These caps come in boxes of 50, at about 15c. You can see pictures and full description in Remington or Winchester catalogs.

Round balls or conical balls were used in these arms, and should be tight enough to fit snugly in the cylinder when rammed down on the powder. If they are not tight, there is danger of their going out two cylinders at a time from the flash, as well as of the balls moving forward under the recoil.

With the heavy conical ball, the energy is high, but not equal to that of the modern Colt .45. The accuracy is excellent if you get the right load. It is possible to use some kinds of bulk smokeless, but it is highly advisable to stick to black powder, which is quite safe with the largest loads you can use.

Bullets are not lubricated. Unless you can get hold of a mould for this weapon, you will probably have to be content with round balls, unless you want to experiment. There is a great deal of fun and pleasure to be obtained from work of this kind.

LOW BASE AND HIGH BASE

I HAVE been reading your articles in *Outdoor Life* on the different loads for the 20-gauge shotgun.

They are very interesting and instructive. I like them very much. I have followed your instructions as to loading and have had grand success. You should have seen me trim the ducks this fall with my little 26-inch barrel 20-gauge. Really, I killed ducks on the pass alongside of the 12-gauge and I do not consider myself any better shot than those that had 12-gauges. In fact, two of them were trap shooters, but 2 3/4 E. C. and 1 oz. of No. 4 certainly did hit hard. I couldn't see as I made any better or longer kills with Super X than I did with the ones I loaded as you suggested in one of your articles. Now, Mr. Askins, I want to ask your opinion in regards to low base and high base shells for Dense Powder. Both Hercules and du Pont tell you to use 1/4-inch high base shells for Infalible and Ballistite. Still, when I was secretary of our gun club, I got six cases of hells loaded by the Liberty Cartridge Co. and three were of 22-grain Ballistite and three were 24-grain of Infalible, all low base shells. I wrote the cartridge company about it and they said they were all OK and would give us good results, and they did. The boys were all well pleased with them and some did not know whether they were high or low base. They shot fine and that was all they knew or cared. Now, here's the point: Lots of times it is hard for me to get high base shells of the kind I want and I can always get low base. Will it be dangerous for me to use dense powder in low base shells? If so, why? I know you know all the fine points of loading shells, so that is why I want your advice before I load any dense powder in low base shells.

J. J. S., Mason City, Ia.

Answer (by Captain Askins): No great consideration be given to this low base and high base business. The low base is advisable, given choice of the two, because it would be difficult to get two charges of powder into a case without detecting it. If the loader has horse sense enough and uses care enough not to put two loads of powder into one shell the one load will be exactly as safe and as efficient as the other. The loading concerns would naturally be governed by the fact that high base shell would require less wadding—if they can save a wad and yet not reduce the quality of the load they are warranted in doing so. To the handloader who doesn't mind putting in one more felt wad, no difference will be found in the two styles of cases. I suggest that where the low base is used with dense powders that the additional wad be placed in the middle, between the bottom wad and the top, and that this extra wad be thirteen gauge (if 12-bore load) instead of twelve gauge. Such proceeding would reduce wad friction to just what it was with the high base and no difference whatever would be found in the ballistics of the two cases or loads.

AN EXPERIMENTAL SPRINGFIELD

I AM going to bother you again to identify what I understand is an experimental rifle made at Springfield probably in 1892. Some years ago I saw possibly a dozen of these rifles in a rack in the room where The Chronograph was at Frankford Arsenal. The action, mountings, lock and stock are those of the old cal. .45 Springfield. The barrel is cal. .30 and very nicely finished and fitted and the stock which has ramrod groove omitted. The rear sight is a miniature Buffington not graduated and there is a short hand guard over barrel in front of sight. The rifling seems to be that of the Krag. On the stock was a label marked "Springfield Rifle, Cal. .30, Received Oct. 11, 1892," marked "N," which refers to the letter N stamped on the barrel just over the chamber. I imagine these rifles were made to test out the cal. .30 ammunition for the Krag, or were such rifles contemplated for the service at that late date?

F. W. B., Rhoadsdale, Md.

Answer (by Major Whelen): Those old Springfield rifles with .30 Krag barrels were some made up for experimental purposes after the Krag was adopted to see if the old Springfields could have Krag barrels fitted to them and thus put to some account the many thousand good .45 Springfields that had become obsolete. The letters on them were probably simply to keep track of individual guns. It was quickly found that while an individual rifle might operate for a time satisfactorily with the Krag cartridge, yet the action was not strong enough, and it would be unsafe to equip these old Springfields with Krag barrels. With your rifle I would advise you to confine yourself to reduced loads.

I am sure ARMS AND THE MAN would be very glad to get anything you might write as to your experiments with bent barrels. I have often shot Springfield .30 cal. rifles with bent barrels, and if the bend was not too much they shot practically as well as straight barrels.

AFRICAN HUNTING

AM planning a ninety-day hunt in British East Africa this coming summer, depending upon the '06 Springfield for most of the shooting. Will you please advise me as to what types of loads and amount of each type I should take, not forgetting to add a few full metal patch of some (unknown to me) shape, weight and velocity, guaranteed to bring home an elephant if I hit him in the right place.

For a heavy gun I had selected the Wesley Richards 425 caliber Mauser Repeating, but the price is prohibitive, \$1,800 on this side. Is there not some other make of the repeater type which would answer the purpose as well, and at much less cost?

My old grizzly bear hunting friend, Ned Frost, of Cody, Wyoming, is very anxious for me to take an automatic rifle for lion and such game in thick cover. What is your opinion of the idea?

A. P. C., Detroit, Mich.

Answer (by Major Whelen): Although I have never hunted in Africa, I have made a very deep and careful study of the subject, as well as the requirements in weapons, having read and studied practically every book in the English language on the subject, most of which I have in my library.

For your general shooting, which will be mostly antelope, you cannot get a better rifle than the sporting Springfield. For regular work on all soft-skinned animals I believe you will get fine satisfaction from the cartridge loaded with 180-grain open-point boat-tail Lubaloy bullet, M. V. 2,725 f. s. I used this cartridge on my recent expedition in the North with excellent results. For elephant, if you are a good and cool shot, you can get results with 220-grain full jacketed bullet M. V. 2,200 f. s. Do not use a pointed bullet for this work as they glance badly after hitting the animal. What you want is the old round nose 220-grain full jacketed bullet.

The late Arthur Neuman, the most celebrated elephant hunter who ever lived, used a .303 Lee Enfield rifle with 215-grain round nose full jacketed bullets, M. V. 2,000 f. s., almost exclusively on elephant on his last expedition into Lake Rudolph many years ago. But he was a most experienced hunter and a very good and cool shot and he never tried to use it on a moving or charging beast, but picked his shots and never fired until he was absolutely sure of putting the bullet in a vital spot. However, one day he was caught by a charging cow elephant. Of course, the small rifle was of no account whatever, he was nearly killed, and was obliged to spend four months in a jungle camp recuperating with no one but natives within a thousand miles. Do not under any circumstances attempt to use this rifle on heavy game unless backed up by a heavy rifle.

Under no circumstances would I take an automatic. They are not reliable enough to stake one's life on, and none of them take ammunition heavy enough for lion shooting. I cannot understand why Ned Frost in sane moments should counsel such a thing. He, of all men, should know better.

In addition to your Springfield, you must have a heavy rifle for thick skinned and dangerous game. The Westley Richards' .425 Mauser is excellent. It does not cost \$1,800 on this side. It sells in London for about 35 pounds—that is about \$160. Add duty, freight, broker's charges, etc., and you have about \$275. This is the cheapest good and reliable rifle you can get. For three months take 100 rounds of soft nose and 100 rounds of full jacketed ammunition.

And don't forget a 12-gauge shotgun. The game bird shooting in Kenia is splendid.

If there is anything further I can do to help you, let me know.

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A MEDIUM LOAD FOR THE KRAG

I AM reading with great interest Mr. Mattern's series on Handloading Ammunition, but I would like at once to make up some special loads for the Krag carbine (22-inch barrel), and will ask you to prescribe same together with resulting ballistics and maximum effective ranges.

I wish one load suitable for anything up to and including such animals as red fox. I judge this would do for crows and hawks at not too great range.

Also I would like to know the lightest load which can be used in this cartridge and carbine with satisfactory results, the idea being to get the safest possible load to use for "knocking around" in a thickly settled farming country. I do not require hair-splitting accuracy, as I am not a good enough shot to benefit by it. I am slowly recovering from a chronic illness extending over about eighteen years, and with returning health my old in-born boyhood love for a rifle is returning with full force. So I desire to spend much time in the open regaining lost skill and better health. To save even a little money I wish to cast my own bullets. Also I desire loads giving, if possible, the minimum wear on the barrel.

As to reloading tools, my very limited knowledge would lead me to favor the Modern-Bond as being entirely satisfactory in results produced, with the advantage that with it I can make up loads for my 250-3000 Savage and other rifles with but slight additional expense for special fittings for these calibers. Also it would appear to me that this make can get me started with a minimum cash outlay (which is imperative), and yet be a good foundation to build upon as I get my doctor's bills paid and have some spare pennies for my hobby. I contemplate, tentatively, getting a Modern-Bond Model B Reloading Tool, bullet mold and dipper, and making a powder scoop to hold correct amount of powder weighed on my druggist's scales by him. Also I contemplate the cake cutter method of lubricating bullets. I realize that this limited equipment means slow work, but I have more time than money just now. I only wish to be sure that the few things I do get will be correct in every way and form the basis of a complete outfit later on. I will greatly appreciate any suggestions you can give to either improve the outfit or reduce the initial cash outlay. Also I should like to know the best bullet lubricant for the above loads.

Anything you can suggest to enable a sick man to return to his hobby and, indirectly, sound health, will be very greatly appreciated. I am a skillful

mechanic, with an engineering education, and any special "kinks" or advanced methods of doing things are always of special interest.

L. J. H., Easton, Md.

Answer (by Major Whelen): Probably the best medium load for the Krag will be Bond bullet A 311870—150 grains, cast 1 part tin to 10 of lead, or 90 parts lead, 3 parts of tin and 7 of antimony. Bullet should be sized to .311 inch. Necks of cases should be resized and then expanded to .311 inch. Powder charge should be about 12 grains weight of Du Pont S. R. No. 80. Bullet should be seated to just such depth in the case that when the cartridge is seated fully in the chamber the lands of the rifling will just barely mark the forward band of the bullet. This load should prove very accurate, reliable, and satisfactory for foxes, crows and hawks. It will not have a very flat trajectory, but then ammunition which has is unsuited for use in settled communities. The extreme range at an angle of about 30 degrees is probably about 2,000 yards. Load is accurate to 300 yards at least.

I imagine that probably your best chance of success in seeking a very light load for the Krag will be to experiment with Bond Bullet C-311500, 90 grains, cast 1 part of tin to 10 parts of lead, and sized to .311 inch. Probably the best powder will be Hercules Unique, and I should start with about four to five grains weight. I think you should have pretty fair results up to 50 yards, but it will not be as accurate as the first mentioned load. Extreme range about 1400 yards.

The above loads will require the sight to be set at an elevation from 300 to 500 yards higher than the service load. Also you will probably have to set the sight over for one or two points left windage. The powder should be loaded loose in the case, with no filler of any kind.

I feel quite sure that in order to obtain good results with cast bullets you will have to obtain and use a bullet lubricating and sizing machine. I was never able to do anything with my cast bullets until I got one, and it solved all my troubles. I notice that Mr. Mattern feels the same way about it that I do. I got one of the very first Ideal lubricating and sizing machines. That was over 20 years ago, and the little machine is still in use. In regard to bullet lubricant, I believe you had better follow Mr. Mattern's suggestions. He has had more experience in that direction than I have.

May I suggest that you look into the matter of accurate sights for your Krag if you have not already done so—preferably a Lyman receiver sight. Also rig up a bench rest to shoot from, and test your loads out carefully at 50 and 100 yards. See my book, "The American Rifle," for details.

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GAS CHECKS FOR H. P. RIFLES

WHAT I particularly would like to know is home-made bullets with copper gas checks and about the diameter and bearing surface of copper bands. Should these be the exact diameter of the bore? The 139-grain M. C. bullets are smaller than the bore. I want to have a swedge made for home manufacture of semi-metal cased bullets, and want to get the correct diameter. I want to make a bullet that can be driven accurately at about 2,000 f.s. and heavy enough to kill a deer up to 100 yards. Any suggestions as to weight of bullet and charge of powder that will give a safe and even pressure, will be very welcome. The bullet would have to have good penetration before it mushrooms, but the best way to get this combination will take a little figuring. Amongst the factory bullets we have soft-point, open-point, umbrella-point, bronze-point, etc. What kind of a point best for an alloy bullet composed of 10 tin, 10 antimony and 80 lead, with gas check and copper band is what I would like to know also.

The open-point expansion 139-grain metal cased bullet being about the size of lands diameter, and having a flat base, will it expand enough before leaving neck of the shell to fill the bore and check the powder gases?

C. J. J., Montreal, Canada.

Answer (by Major Whelen): Gas check bullets for high-power rifles should be larger than groove diameter. About .002 inch will be found very satisfactory. The bullet should also be so designed that when the bullet is seated in the case, and the cartridge seated in the chamber, the bullet will just touch the lands. As all Mauser rifles differ considerably in groove diameter, and in the throating of the chamber, I would advise your taking your rifle to a good gunsmith and have him measure the bore and make a sulphur cast of the chamber. Then you can go at your problem intelligently.

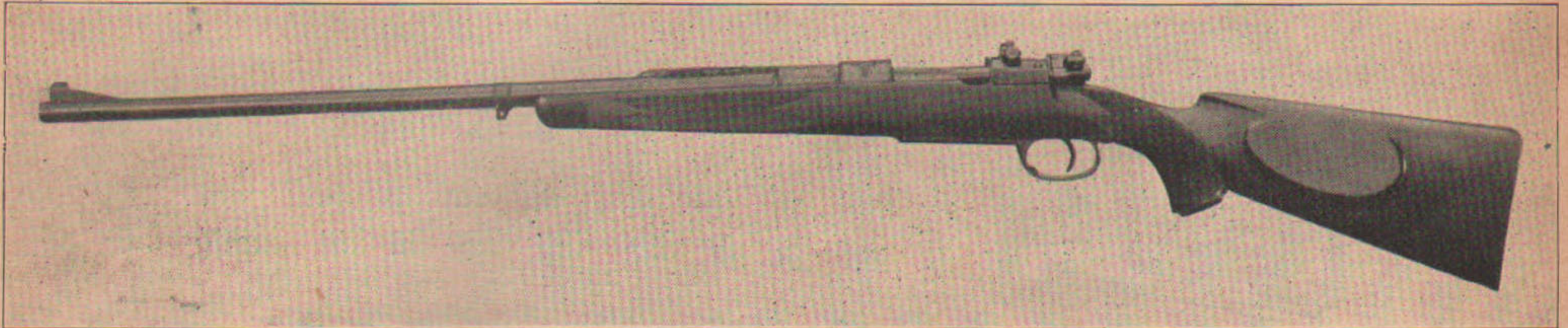
Metal cased bullets will not upset before leaving the neck of the case. When the powder begins to burn the case at once expands to fit the chamber, gas rushes up past the sides of the bullet and escapes past it until the bullet has traveled two or three inches up the bore. Gradually the resistance encountered by the lands causes the bullet to expand slightly and shut off the escape of gas. The smaller the bullet in relation to groove diameter, the more gas escaping, and the longer is the delay in sealing the bore, also the bullet is deformed more. In the case which you quote I think you would get best results by having a swedge made to expand the metal-cased bullet to the exact groove diameter.

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John M. Browning
James Burns

Kellogg K. V. Casey
Wallace M. Clay
Edward C. Crossman

Julian S. Hatcher
C. I. B. Henning
Adolph O. Niedner

Thomas G. Samworth
Charles E. Stodter
Glenn P. Wilhelm

Townsend Whelen
Grosvenor L. Wotkyns

Among those who have passed over the Great Divide may be mentioned Franklin W. Mann, Walter G. Hudson, and E. A. Leopold.

These men have placed American Rifles in ballistics and in accuracy far in advance of the rest of the world. Their efforts have covered every phase of the game, military, target, small bore, and sporting. It is our desire to amalgamate their ideas and their developments into the production of distinctive American Rifles, superior in accuracy, reliability, workmanship, design, and beauty which will lead the world. Our organization for this work is now assured. The equipment of our plant is complete, modern, and working. We are now ready to accept an order for your rifle, constructed as you wish it in every detail by master craftsmen with brains behind them, and we can assign you a date on which we can ship this rifle to you. We publish a circular which we will mail to you if you will put the word "Circular" and your name and address plainly on a postal card.

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HUNTING SCOPES

I AM keenly interested in rifle shooting and big game hunting and would like to have you people assist me in the selection of a telescope sight for my rifle. I sold my 30 gov. box magazine Winchester rifle a few days ago and intend to purchase through the N. R. A. later on a Springfield bolt, star gauge, specially selected for marksmanship.

I did not sell the 5-A Winchester telescope sight which I have used for the past three years on my box magazine rifle, but retained it. I like it. It has a 5 1/2 foot field in 100 feet and also has a recoil relief that prevents the recoil from bumping the marksman's eye with the telescope eyepiece. But I thought that perhaps you people knew of a better and more accurate telescope sight. Do you?

How about the Army telescope sight? Is it a superior sight to the Winchester and can it be secured from the Government through the N. R. A. or from the manufacturer? Who manufactures this sight?

Contrary to the advice of some experts I find the telescope sight invaluable for hunting purposes. I shot my buck last year with it, bringing him down the first shot with a bullet through the heart. Had it not been for the cross hairs I could never have placed my bullet so accurately, and had it not been for the power of the lenses I could not have distinguished his horns through the oak shrubbery. Here in this country if you shoot a buck and he runs two hundred yards another hunter will usually get him, so it is of vital importance that you drop him in his tracks. The trouble with most hunters in regard to this sight is that they condemn it before they have had time to become expert in the use of it. I have become so proficient in its use that I can flush a pheasant and, swift as he is, I can locate him in the field of the glass almost instantly. I am going to attempt the shooting of these birds on the wing next year with my rifle, which is something I never attempted as yet, although I have often placed the cross hairs on them while in flight.

Now my hobby with the rifle is *extreme accuracy*, especially at the longer ranges. Would it detract from the accuracy of the Springfield if I equipped it with a sporting stock and recoil pad? I imagine it would but I would like your opinion. In case it would not I would like to make the change on account of the appearance of the gun.

Is the U. S. Army telescope sight set on top of the gun or used with offset adapters similar to the Winchester? If used on top of the gun does it not interfere with the ejection and insertion of car-

tridges? What is the field ratio of the Army sight?

Some time ago at Camp Perry two men each shot 74 consecutive shots into the bull's-eye at 1,000 yards. One of these men used a telescope sight. What kind did he use?

I understand the Army sight has no recoiled relief. Does this not have a tendency to cause flinching by bumping the shooter's eye or rather by the shield bumping his forehead?

J. G. W., Weedville, Pa.

Answer (by Major Whelen): I can really suggest nothing better for your purpose than the Winchester Type A-5 power telescope sight with the two rear mount, except perhaps a telescope made to order by Fecker, which would be quite expensive. The objection to the Winchester scope for hunting is its rather small field, which makes it somewhat difficult to surely catch your game in the field of view as you throw your rifle to the shoulder, and the small lateral relief which makes it necessary to have your eye almost exactly in line with the axis of the glass to obtain the full field of view. Both these objections gradually disappear as one becomes used to the glass, but lots of practice in throwing the rifle to the shoulder and aiming is necessary.

The old Warner and Swazey Army Telescope sight is obsolete, and useless for your purpose. New Government telescope sights are still in the experimental stage and only experimental models have been made.

To get good results from a telescope it should be mounted squarely on top of the rifle, and the comb of the stock should be as high as possible in order that your cheek may rest against it when you aim. Thus the comb helps to make your eye come each time to that place where you surely catch a full view through the field, a very important point in shooting.

Practically all of the telescope sight records at the National Matches were made with the Winchester scope on the Springfield. These were made with the rifle fired in the prone position. In this position the eye-piece of the scope is located just in front of the bolt handle. Located thus it does not interfere with the opening and closing of the bolt. But if you are to use the telescope on the Springfield pulled to the rear so that the eyepiece comes in the correct position for offhand (standing) shooting, then after each shot you will have to push the scope to the front before you can open the bolt, and then afterwards pull it to the rear again. This is the grave objection to a telescope on the Springfield for hunting. Otherwise the glass does not interfere with the loading or operation of the rifle except that

you cannot load with a clip, but have to place the cartridges singly in the magazine.

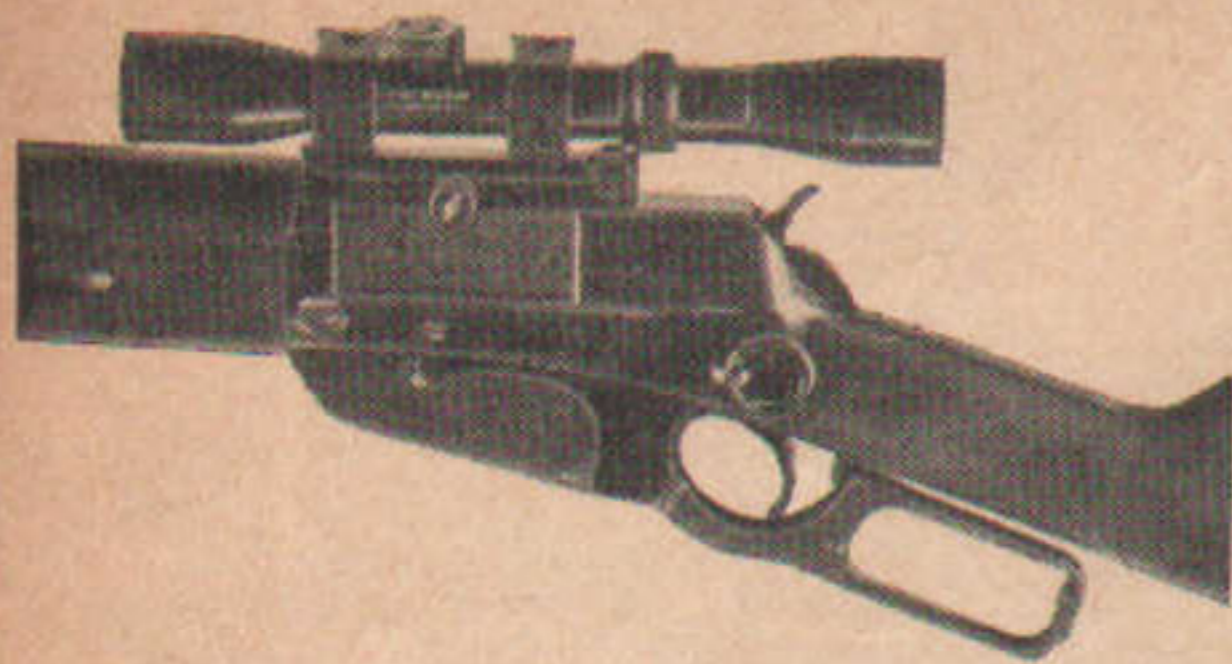
When a Springfield is remodeled and equipped with a sporting stock the accuracy is not injured a particle provided that the work has been well done. The recoil shoulder of the stock, the barrel band, the fit of the guard screws, must be exactly right. The only gunsmiths that I know of by experience who can be absolutely relied on to do the work as it should be done are King and Pachmayer of Los Angeles, Worthen of San Francisco, Griffin of New York, and Howe of Philadelphia. Also there is the .22 caliber pistol grip stock for the Springfield. Should you decide to purchase a Springfield you can obtain a .30 caliber star-gauged Springfield equipped with a .22 caliber pistol grip stock with high comb, and Lyman No. 48 receiver sight from the Director of Civilian Marksmanship at a cost only slightly more than for the regular Springfield. I think you can even have this rifle equipped with the dove-tail bases for the Winchester scope screwed to the barrel. This rifle, with Winchester scope, would be an ideal combination for you were it not for the fact that with the eye-piece in the correct position for offhand shooting you will have to push the scope forward and pull it back after every shot.

Other possible combinations which might fit your needs are as follows:

Savage Model 1899 lever-action rifle for the .250-3000 cartridge. Rifle *must* have a *solid frame* or it will not be accurate enough for your purpose. The scope can be located squarely on top, and the eyepiece drawn back to any position without interfering with the operation of the rifle in the slightest. It would be advisable to have a special stock made to fit you exactly, and with high comb. This rifle is very accurate, an excellent deer gun, and a fine all-around weapon. Splendid reduced loads have been developed for it.

Perhaps the very best combination, if high price is no objection, would be to obtain a U. S. Model 1917 rifle from the D. C. M. Have it equipped with a Winchester match barrel. Have the rear sight base milled off the receiver. Place the front mount of the telescope on the receiver just over the breech of the barrel, and the rear mount on the rear of the receiver where the rear sight base was milled off. The bolt handle does not interfere with the scope, nor the scope with the operation of the rifle. A new stock to fit, with high comb, would be a necessity. The cost would probably be about \$160.

When you have digested this letter you will probably have other questions. Fire them in. I'll try to help.



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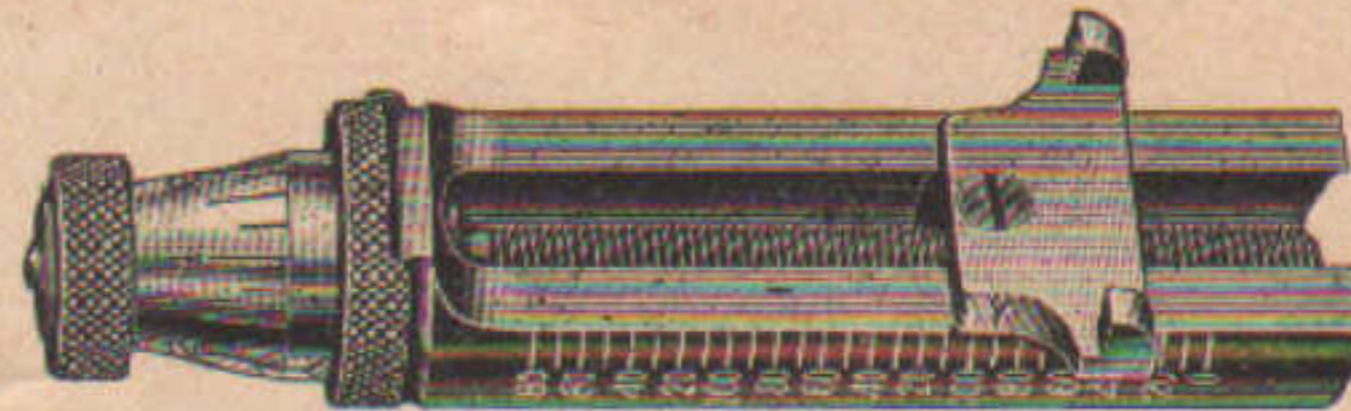
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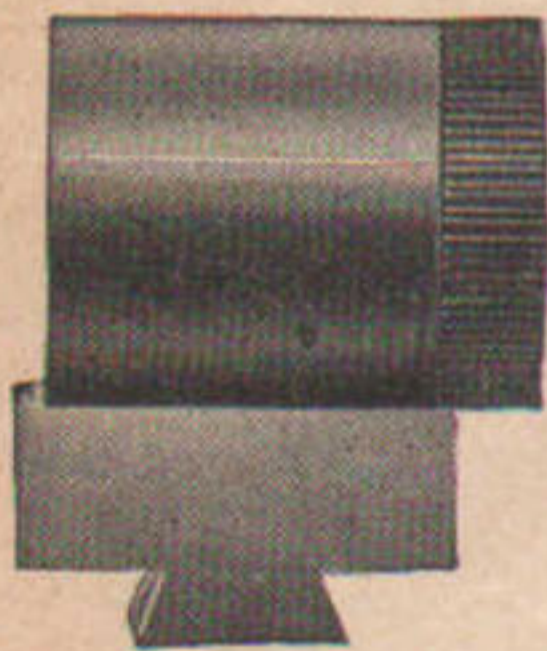
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FOR SALE ONLY—47 tanned muskrats, \$75. .45 S. A. Colt, \$10. .38 Colt Army Special, \$20. Trade both guns for A-5 Win. Scope or O. M. Colt. Elmer Keith, Winston, Montana.

FOR SALE—Star-gauged Springfield rifle, specially selected (new) barrel, Warner and Swazey Telescopic Sight attached, but detachable; rifle shopworn outside; inside perfect. Sling, telescope case and cleaning rod included. First M. O. for \$45 takes it. L. C. Leighton, Cristobal, Canal Zone.

FOR SALE—Colt .38 Special, 6 inches blued, holster, cartridges, tool, and lubricator, \$30. Krag carbine, \$10. 200 Springfield S. P. cartridges 180-grain, 2,700 f. s., the lot \$15. J. F. Weigand, 203 Division St., Wausau, Wisconsin.

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FOR SALE—22-32 Smith & Wesson heavy frame target revolver, target sights, 6-in. bbl., .22 calibre, blued finish like new, \$24.50. Also 12 ga. Model 10-A Remington repeating shotgun, 30-in. bbl., excellent condition inside and out, full choke, \$25. The People's Store, Hordville, Nebraska.

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FOR SALE—German Police Dog, 8 months old, price \$50, or EXCHANGE for 1922 Springfield .22 Match Rifle. Must be new and perfect. Dog is from fine pedigree stock. H. R. Maxfield, New Hartford, Conn.

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FOR SALE—.32-20 S. & W. Target Revolver, 6-inch barrel, Ivory bead sight, new, \$25. Paul Rieger, 213 Hazlet St., Brackenridge, Pa.

BARGAIN—Library of Natural History, 6 vols by Lydekker and associates. Slightly damaged. \$10. R. B. Clugh, 1148 S. Main St., Akron, Ohio.

FOR SALE—Double set trigger with guard, complete for Springfield rifle, \$30. Laurence Nuesstein, Care Arms and The Man.

FOR SALE—Colt Automatic Pistol and .22, new, \$25. Schuetzen stock for Stevens Ideal rifle, No. 44½, cheek filce, nickel plated butt plate, \$6. C. E. Stodter, 1115 Woodward Bldg, Washington, D. C.

FOR SALE—.45 Colt Automatic, Government Model, very good condition, with extra new barrel, 2 magazines and leather holster, \$25. Box 19, Arms and The Man.

FOR SALE—.22 Winchester Automatic, Model 1903. Perfect. Shot 50 times. \$30. Box 3, Arms and The Man.

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TRADE—Colt .22, 6-inch barrel, target revolver and holster, blue, fine condition, for Colt Frontier, or Bisley S. A. .38-40, 7½-inch barrel, blue, like condition. R. T. Cowan, 1306 Francis St., St. Joseph, Mo.

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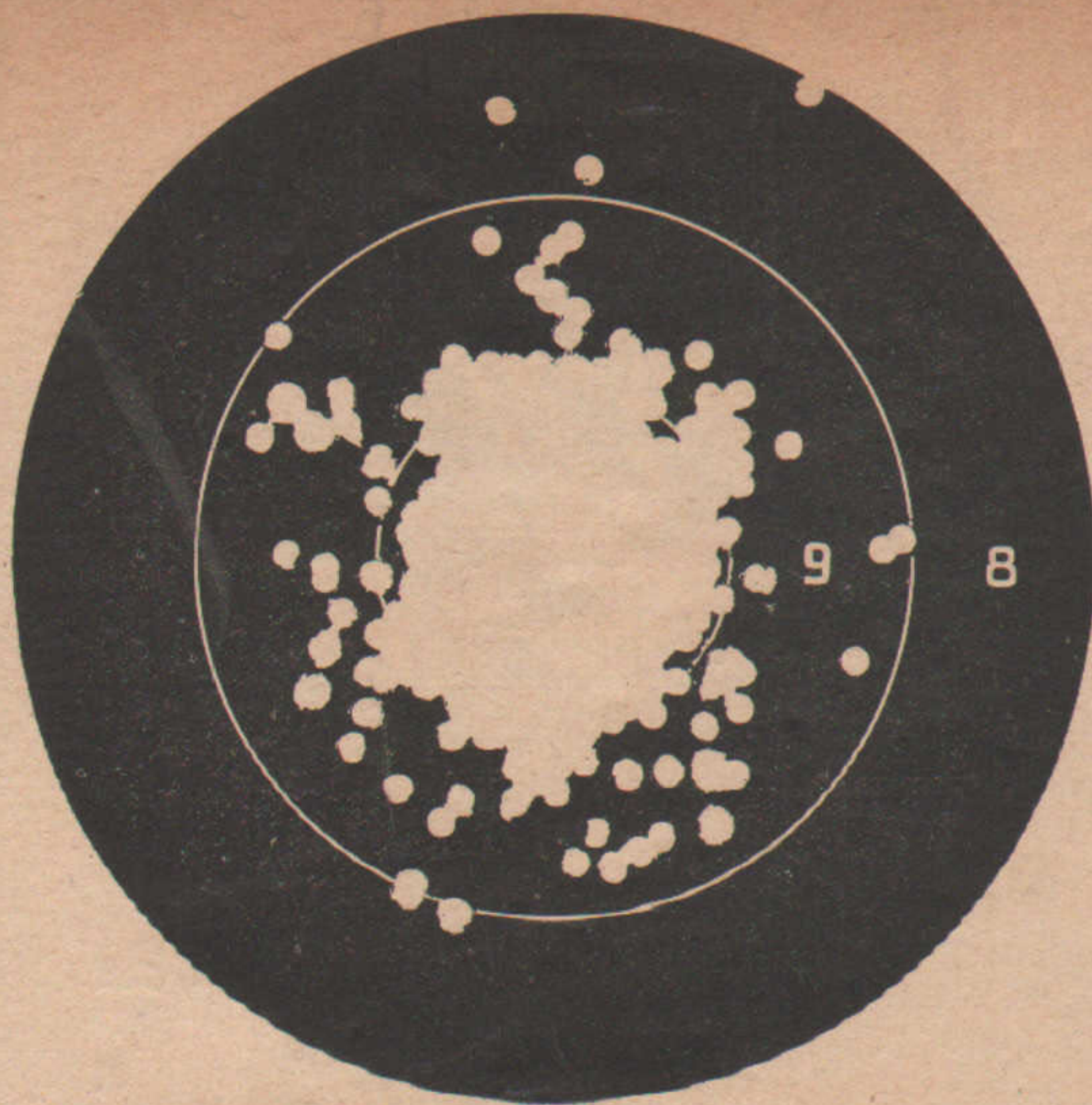
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The targets and composite reproduced below were also shot by Mr. Corsa during the same matches. These targets are interesting for they were shot at 100 yards on the special "Pope" target, the 5 ring of which measures 8/10-inch in diameter, the outer rings 4/10 of an inch apart. Scores 23, 25, 24, 24, 24, 24.

These targets prove three things:

- 1st—good ammunition
- 2nd—good holding
- 3rd—a good rifle

Each item is as important as the other and all three are necessary to make good scores. If any shooter has possession of a good rifle and can "hold" we will supply—that good ammunition—US .22 N. R. A. cartridges—made for exceptionally accurate target shooting.

Of the 27 possibilities made during these matches, 22 were made with US .22 N. R. A.'s, all other makes made but 5. Eighteen possibles were made with Pope barrels.

UNITED STATES CARTRIDGE CO.

111 Broadway

New York, N. Y.

US .22 N.R.A.
Long Rifle Cartridges

