THE AMERICAN RIFLEMAN'S MAGAZINE

ARMS AND THE MAN

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"NITROCELLULOSE" vs. "NITROGLYCERIN"

IN RIFLE POWDERS

We find a revival of interest in what has been considered a settled issue: "Is it necessary or desirable to incorporate nitroglycerin in rifle powders?" In so far as Military Rifle Powders are concerned, this question was settled in this country in 1909, when "Du Pont 1909 Military" (Rifle Powder No. 20) replaced "Du Pont 1908 Military" (Rifle Powder No. 19) as the U. S. Government Service Powder for small arms. We believe it of interest as a chapter in "THE STORY OF RIFLE POWDERS" to quote to you an editorial printed on page 542 in the April 17, 1920, issue of *The Field*, the County Gentlemen's Newspaper (London), showing what our British cousins have experienced.

RIFLE POWDERS

The Ideal. At the present time we are in a period of transition. ***The doom of Cordite has been sealed. True it is still being used in many sporting rifle cartridges, but it is doubtful whether it will survive much longer, its place being taken by a nitrocellulose powder.*** The change is of the greatest importance, the advantages which it will bring being so great that we are at a loss to understand why it did not occur sooner. But before we discuss these advantages, let us see what are the properties which an ideal rifle powder should possess.

First, it should be capable of developing sufficient pressure to produce the very high velocities which are now considered necessary. Then there should be no smoke. The action of the powder should not be in anyway affected by variations in temperature, and the powder itself should be capable of being kept for a considerable time, under all sorts and conditions of climate. It should cause neither erosion nor corrosion and its action should be easily controlled.

Perhaps it might be well to point out that erosion is the actual wear on the inside of the barrel produced by the flame and gases produced by the explosion, while corrision is the wear on the inside of the barrel, caused by the chemical action of the residue of the powder after firing. Erosion takes place at the instant of firing and during the passage of the bullet down the bore, while corrosion is a far slower process which may go on for days or weeks. From this it is obvious that cleaning can ward off most if not all of the effects of corrosion, while it is no safeguard whatsoever against erosion.

Let us now consider the various classes of powders which have been in general use during the last 30 years. Broadly speaking, there are three main varieties, each fundamentally differing from the other, viz., black powder, nitroglycerin powders, of which Cordite is the most notable example, and nitrocellulose powders.

Black Powder. This gives off heavy smoke and cannot produce very high velocities, but otherwise it fills all the conditions which we have laid down. Its action is absolutely unaffected by temperatures and it gives identical results in the plains of India in June as it would in the Yukon in January. It will keep forever as far as practical purposes are concerned. Its burning causes no erosion, while its residue, so far from corroding barrels, can almost be classed as a preservative. Finally, its action can be easily controlled by variations in the size of the grain.

Nitroglycerin Powders. These produce no smoke and velocities as great as are needed. They keep fairly well in the tropics and better still in more temperate climates, while their action can be controlled by varying the size of grain, stick or tube, whichever shape is used. Here, however, their good points come to an end. Their action is affected by temperature to a very great extent indeed. The temperature at which they burn on exploding is very high, with the result that they invariably cause erosion, while their residue is strongly acid, and thus very thorough and careful cleaning is rendered absolutely essential.

Nitrocelluiose Powders. These produce no smoke and velocities even higher than those given by Cordite, but they do not keep so well as the latter powder, particularly in the tropics. Their action can be controlled to an even greater extent than in the case of Cordite, and they are not affected by temperature to anything like the degree to which Cordite is, although they are not quite so immune to temperature changes as Black Powder.

They burn with far less heat than Cordite, but owing to temperature of burning being so much lower, cleaning is rendered far more easy. The greater the heat with which a powder burns, the more the pores of the steel are opened, and consequently, the more the fouling is forced into the metal itself. All the fouling can only be taken out by a series of cleanings made at intervals of a few days. The barrel "sweats" the fouling out of its "pores" a little at a time, taking several days over the process. It is obvious that the less the pores are originally opened by the heat of the explosion, the more readily will the barrel "sweat" out what fouling it has assimilated, and consequently the more easy it will be to clean.

Erosion. The two points on which nitrocellulose powders score over Cordite and other nitroglycerin powders, apart from the very important matter of ease of cleaning, are the freedom they give from erosion and their far greater immunity they give from changes in temperature. The question of erosion is of the very utmost importance. Cleaning, as has already been pointed out, is no preservation. With Cordite, erosion is bound to take place. The softer the steel the greater will be the effects, and the modern very hard steels are not acted on to anything like the extent to which the milder steels of twenty-five years ago were. This is one reason, and a very important one, why we do not approve of the use of reduced charges of Cordite in black powder rifles. Such rifles are not modern, and their barrels are far too soft to withstand the erosive action of Cordite with any chance of success. But even the very hardest of modern steels cannot escape with impunity from the terrific temperatures set up by an explosion of Cordite. The cupped jute wad usually loaded in all Cordite rifle cartridges produces a little protection from the heat of the flame of the gases, but it is not nearly enough, and whenever Cordite is fired in a rifle, erosion occurs, it is impossible to prevent. No barrel can retain its virgin accuracy for long under such circumstances. The life of a barrel depends only on the degree of accuracy expected from it. A match rifle barrel might last from 300 to 500 rounds—not more—when Cordite is fired. With nitrocellulose powder, a match rifle barrel will retain its original degree of accuracy for 4,000 or 5,000 rounds, while the barrel of a sporting rifle would last almost indefinitely.

Effects of Temperature. ***Almost equally important to the big game sportsman at any rate, are the effects of temperature.*** With Cordite a rifle might shoot from 6″ to 8″ higher at 200 yards in the tropics than it would with the same load in England. In the case of a single rifle the alteration in the necessary sighting is a comparatively simple matter, although it is a nuisance. With double rifles, however, there is the additional danger that the barrels will no longer shoot together. Few sportsmen realize the very great difficulties to be overcome in so adjusting the two barrels of a double rifle that the most expert shot can find no difference in the shooting between them. This nicety of shooting can only be repeated when the chamber pressures and muzzle velocities are the same as for which the particular rifle was regulated. A double rifle which is capable of making a 2″ group at 100 yards in England might fail to make a 6″ group at the same range in the plains of India in June with the same cartridges out of the same box as those which gave the good results at home, if Cordite was the propellant used. Rifle makers surmount this difficulty by having all cartridges for use in the tropics loaded with a few grains less charge, so as to insure the pressures and velocities set up in hot climates being the same as those developed in England, by the heavier charges. Unfortunately, the temperature of the tropics is even a more variable quantity than that of the British Isles. The greatest heat is probably encountered in India in the hot weather, but during the cold weather in that country the temperature is not sufficiently great to make any appreciable difference to the shooting of a rifle from its performance in England. The northern portions of the Sudan present a similar difficulty, but elsewhere in Africa the heat is fairly constant throughout the year in any one district. Even so, the big game hunter may wander through several districts of varying temperature. Thus it will be seen that to cater entirely for the question of temperature by fixing any single "tropical load" is impossible. ***Nitrocellulose powders are not so affected by these changes to anything like such a serious extent, and by their adoption it should be possible to regulate and sight any rifle in England for very nearly exact shooting with the same load in almost any part of the globe.***

Summing Up. It will be seen, therefore, that the only respect in which Cordite can in anyway hold its own against a nitrocellulose powder is that it will keep in good condition rather longer. We feel certain that this difficulty will be overcome as more nitrocellulose powder is manufactured. Such enormous improvements have been made during the last few years that there is every reason to hope that a more lasting nitrocellulose powder will shortly be made. ***At present, Du Pont No. 16 powder is almost entirely used by the Government in military ammunition, but it is an open secret that our own manufacturers are going to undertake the task of producing nitrocellulose powders for both Government and Sporting use. We have every confidence that they will succeed as well as the great American firm.***

The italics in the above are ours. "THE FIELD" has a special department, with equipment for tests and investigations, devoted to "Shooting," and this has a high reputation among all English-speaking people.

E. I. DU PONT DE NEMOURS & COMPANY, Inc.

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International Armament

By Stephen Trask

AXIOM hath it that the unskilled workman blames his tools; but such an alibi—if any shall later be needed—can not apply to the weapons upon which the United States Rifle Team relies to back up their claim to International honors.

Nor is it likely that there will be any occasion for an alibi. When the team sailed for Cherbourg on the *President Adams*, August 23, the week spent in practice since the Quantico Tryout demonstrated that the combination of men and rifles this year should command the confidence of the shooting public. At the last moment the team lost one of its strongest members, Lawrence Nuesslein, who was unable to make the trip—but the five high men in the last practice day at Quantico ran up scores which are a testimonial alike to their skill and to the super excellence of their equipment.

Reference to the story of the Quantico Tryout shows that the average of scores made by the team as it then stood paralleled a score of 5120 points under International conditions. The last day's practice at Quantico, giving a total of 1600 for the offhand, 1754 for the kneeling and 1768 for the prone, with Stokes shooting in Nuesslein's place and Lt. Commander Osborn, Major J. K. Boles, Sergeant Morris Fisher and Marine Gunner C. A. Lloyd completing the field, gave a team total of 5122 points. In this practice a marked improvement in the offhand and kneeling positions was apparent, with a balancing fall-off in prone scores, but as the scores prone were undoubtly due to a mechanical condition which was discovered and remedied, there need be little apprehension that the team will continue to be low in the favorite American position. So much for the proof of the pudding, which in this instance lies in the shooting.

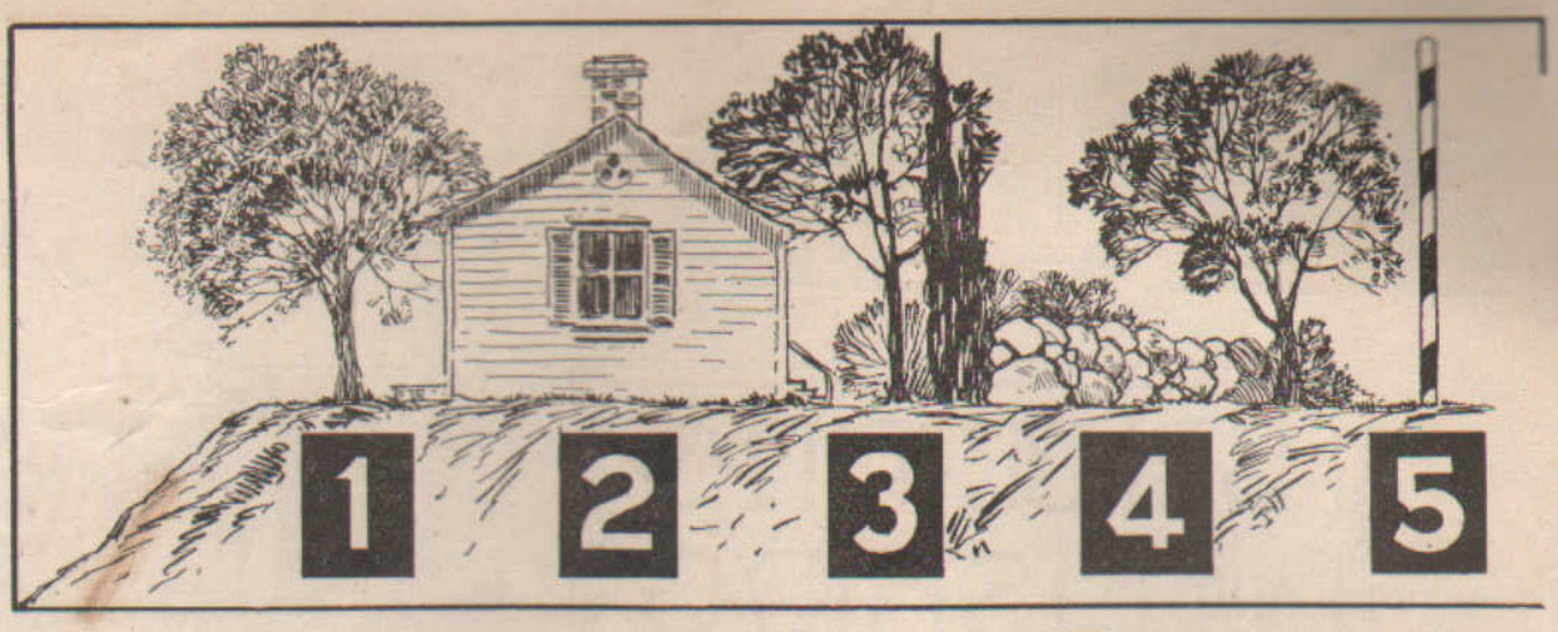
The International Match rifle of 1922 is a product of the combined skill and ingenuity, indirectly of a group of men who for several years have been studying the international game and observing continental weapons and match practices, to the end of producing the best weapon possible for use at 300 metres, and directly of Springfield Armory and the Marine Corps Quartermaster Depot at Philadelphia.

Although the favorite match rifles on the continent almost invariably make use of the sure and snappy Martini falling block action, the men having in hand the designing of an arm for the 1922 team believed that with a few non-fundamental refinements, the American type of Army rifle could be transformed into a match weapon not only of gilt-edge accuracy, but which would lend to the shooter every legitimate advantage possible. Therefore as a basis for the new International Match rifles, the heavy barreled Springfield Match rifle, Model of 1922 was taken.

At the conclusion of many conferences it was apparent that about the only part of the ordinary type rifle which would remain practically unaltered would be the heavy barrel. Rifled and chambered by the best barrel makers at Springfield, it was accepted at face value, save that the tool marks were removed and the bores polished by careful lapping in the hands of expert workmen and were bedded in the stock with extreme care to prevent bearing. So the barrels are full 24 inches long straight taper from 1⅛ at the receiver to ⅞ inches at the muzzle.

Full length view of the New International Match Rifle Model of 1922 which will be used by the United States Team at Milan.

The stocking of the new rifle was a matter regarded as being of the greatest importance. The generally over-large measurements of the issue match rifle stock were not at first disturbed, but by rasping away the excess of wood, each butt stock will later be individually fitted to the requirements of the man shooting it before it is used in the matches. The pistol grip and foreend, however, were well checkered. Next, four unique and important refinements were added—a red fiber butt plate, an adjustable and removable lower prong, an adjustable palm rest of new and improved design and an adjustable front sling swivel. (*Continued on page* 18)



A typical layout for a Sniper's Match such as was held at Wakefield. This match proved to be a popular drawing card and attracted many entries.

SNIPER MATCH A FEATURE

A CAMOUFLAGED village stretching across the top of the 200-yard embankment, dim silhouettes exposed for a few seconds at a window, or behind a tree or a wall, a rifleman watching each 40-foot sector of the village, alert to loose off a shot whenever the target appeared here or there; these formed were the machinery and high lights of a most interesting and unique competition staged in the course of the United Services of New England Matches.

The introduction of American riflemen to sniper matches on the Wakefield, Massachusetts, Range, where the meeting was held from August 16 to 19, proved popular beyond all expectation, and it is likely that a team and an individual event of this character will become a permanent feature of the New England program.

The schedule of which the sniper events were part provided the first get-together of the 1922 season for Service, National Guard and civilian teams.

With such events as the Hayden "All America," which follows the National Match course, the Marine Corps Long Range Match and many other competitions embracing some one of all the ranges from 200 to 1,000 yards, the Wakefield meeting presented an excellent opportunity for observing not only the work of two Service teams who will later be contenders in the big National Team Match, but also the behavior of the new gilding-metal boat-tail bullet.

The Marine Corps team, under Major Ralph S. Keyser, Captain, and Capt. A. B. Hale, Coach, shorn of practically every one of the old timers by the National Match ruling governing team personnel, turned out with a fine bunch of young shooters, whose winning total of 2809 in the Hayden gives them at this early stage of the game a percentage per man of 93.36 over the National Match course for the first time in open competition on a difficult range.

But if the dope does not undergo a radical change, the Coast Artillery Team under Major W. S. Fulton and Major Frazer is due to prove a dangerous competitor at Camp Perry. This branch of the Service has developed some remarkable and consistent shots—a team which headed the Marines by 1 point at the close of the first four stages of the Hayden and which lost the event on a margin of only 14 points. In this competition the C. A. C. averaged 93.10 per man.

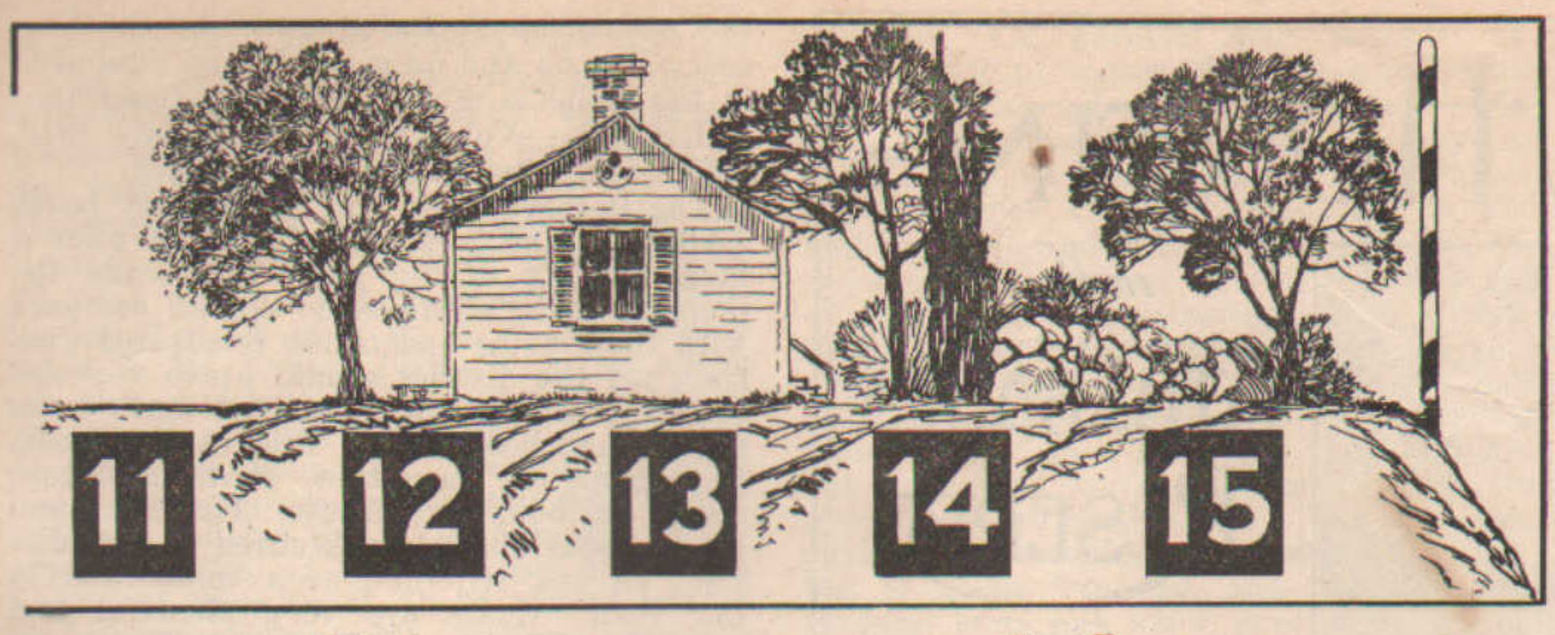
In observing the shooting of the Coast Artillery Team, one can not but be impressed by the spirit these men are showing in their efforts to build up a top-notch team. A case in point is that of Sergeant Otto Bentz. Bentz is a natural "southpaw," and through his shooting career until last fall, he fired from the left shoulder, working his bolt with his left hand, and while he attained a certain degree of proficiency, he soon arrived at the point where he was certain that the limit of his skill had been reached in the position in which he was forced to shoot. All of last winter Bentz practiced from the right shoulder, sticking to it until he was able to join the team squad this year and shoot as well as any of his fellows from the right shoulder.

As to the behavior of the gilding-metal boat-tail bullet, the 1922 National Match ammunition is giving unusual accuracy without metal fouling. It is true that an occasional and puzzling "unaccountable" not consciously pulled nor the result of an obvious adjustment error, was encountered at Wakefield by experienced shots; but it is safe to place the responsibility for these occasional happenings upon the human element where it belongs in practically every instance when the shooting is not done from a machine rest, and is done on a range noted for tricky and unguessable air currents. It may be worth while to mention in passing, for what it may be worth, that some of the riflemen in training at Wakefield hold to the belief that elevations with the new cartridges are susceptible to slight variations with heat, and those who so believe are careful neither to lay their ammunition out in the sun nor to leave the cartridge over long in a heated barrel before firing. But be all this as it may, the riflemen at Wakefield have found that the 1922 National Match load will ride the

MARINE CORPS, NO. 1 RIFLE TEAM WHICH CAPTURED THE "HAYDEN"

Lineup—Front row, left to right: G. R. Lee, R. O. Coulter, Capt A. B. Hale (coach), Maj. R. S. Keyser (Team Captain), J. Alexander, E. J. Nelson.

Back row, left to right: N. Tillman, Capt. W. W. Ashurst, E. J. Doyle, S. L. Stephenson T. J. Jones, J. R. Tucker.



The Sniper target is easy to prepare. The House is canvas mounted to a target frame, the trees are small pines stuck into the Embankment and the wall is painted cloth or cardboard.

At Wakefield Meeting

by Kendrick Scofield

wind, is accurate and does not deposit lumpy fouling.

The prize list this year at Wakefield was particularly attractive. Aside from the Hayden Trophy, the Marine Corps Long Range Trophy and the New England Interstate Trophy—all team events—the prizes for the individual matches were very happily selected—watch fobs, watches, smoking sets, table silver and similar awards which appeal strongly to the rifleman who has already won a number of medals and has no particular desire to add decorations to an already large collection.

With Maj. Gen. Walter E. Lombard, National Guard of Massachusetts, as Executive Officer, Maj. J. W. Hanson of Maine, Assistant Executive Officer, Maj. John J. Dooley, U. S. M. C. R., Chief Range Officer, and Maj. A. G. Reynolds, Massachusetts National Guard, Statistical Officer, the matches of the United Services of New England started off with keen competition on August 16.

The shooting conditions on the first day of the series were not ideal, but were sufficiently good to permit the greater part of a field of 95 entries in the Lyman Match, a rapid-fire event calling for 10 shots at 200 yards, kneeling or sitting from standing, to hang up such a number of possibles as to make the deciding of ties a somewhat puzzling procedure. When the record run was over it was found that the number of competitors with possibles would fill two relays in the shoot-off. At the end of the first shoot-off, only a few of these had been eliminated. And so the game went merrily on, the string of possibles threatening to become monotonous and to interfere with the progress of the day's schedule. Through four runs the D target was used without doing more than eliminating a very few of the competitors each run and then General Lombard and Major Dooley hit upon an expedient which put an end to a game which was apparently becoming interminable.

The fifth shoot-off called for rapid fire on the A target, in order to decide first place, the others having been fairly well determined by the previous runs. On this last shoot-off, Lieut. N. Tillman of the Marines took first place on a score of four possibles and a 49, a total of 249 out of 250, with Sergeant J. R. Wier, U. S. M. C., and Captain E. H. Stillman, Coast Artillery Corps, second and third on scores of 199 out of 200. In addition to the first fourteen places which carried prizes, 24 other scores of possibles or better failed to get into the money.

The McKenzie Match—2 sighters and 10 shots prone at 600 yards; the Phelan Match—10 shots rapid-fire prone from standing at 300 yards; and the Lynch Match—2 sighters and 10 shots at 1,000 yards, completed the shooting on August 16.

The Phelan Match was called at 1:30 o'clock, and as in the Lyman Match, the possibles began to pile up from the start. In this event, three attempts were made to break the long string of ties on the D target before, acting upon the experience gained in the morning, the A target was called into play with the result that the event went to Sergeant J. R. Wier, U. S. M. C.. on a score of 198 out of 200, with Sergeant T. J. Jones, U. S. M. C., second, with 197, and Sergeant Otto Bentz, C. A. C., third, on a similar total. As in the Lyman Match, so in the Phelan there were fourteen competitors with possibles or better who did not get in the money.

The McKenzie Match, shot in the morning, was fired under good light but nasty wind conditions, but the first six places were won with possibles or better. Running a perfect score and continuing to shoot, Captain C. A. Chestledon of the Coast Artillery Corps hung up five additional bull's-eyes and won the match, with Private G. L. Sharp and Sergeant J. C. Stafford of the Marines in second and third places respectively on possibles plus 2 bull's-eyes. Scores of 49 continued through the prize list of 15 places and left 9 remaining similar totals not good enough for the money.

The Lynch Match recorded 100 entries for the 1,000-yard range in the afternoon. There the shooter found very hard conditions. The light was good, but a variable wind, and an inability to dope conditions from any visible indications prevented the making of any possible scores. Sergeant M. P. Campbell of the Massachusetts National Guard took this event one down, with Private Cahall and Sergeant Doyle of the Marines in second and third places on scores of 49 and 48 respectively.

(*Continued on page* 19)

In the Hayden Match conditions the fight at 1000 yards was watched by a large gallery.

BIG GAME HUNTING

in the ATHABASCA RESERVE

by VAL A. FYNN

Fording the Big Smoky near Grande Cache

Donald Phillips and his pack dog in front of his First Cabin down the Smoky. The dog carries up to thirty pounds.

Cabin on Mt. Robson Pass and Mt Robson.

Camp at Sheep Creek Forks.

THE Athabasca Forest Reserve lies in Alberta, Canada, north of the 53d parallel and immediately east of the British Columbia boundary line. It is in the main about 100 miles long and 30 miles wide, with a 25 mile wide offshoot reaching some 30 miles north along the B. C. border. The southern boundary of the Reserve coincides with part of the northern limit of the Jasper National Park. The Grand Trunk Pacific Railway runs close to the southern boundary of the Reserve and good trails lead into it from Entrance and from Mt. Robson Station. Most rivers which cut through or rise in the Reserve flow north; the Big Smoky is the largest of these and discharges into the Peace River at Peace River Crossing. West of the Smoky, the Reserve is very mountainous, with a good deal of "brulé" or burnt and down timber and the trails are rather poor, but east of the river, the country is rolling, green timber predominates and the government has cut and maintains several fine 8-feet wide trails and some rough wagon roads. No good maps are available. The region about Mt. Robson is well shown on A. O. Wheeler's map accompanying the reports of the Alpine Club of Canada's 1911 expedition and published by the Surveyor General's Office in Ottawa, but for the rest, one has to rely on the admittedly inaccurate 1920 map of the Athabaska Forest prepared by the Forestry Branch and on a small map published in the Bulletin of the American Geographical Society—Vol. XLVII, No. 7, July 1915, which takes in a little more country.

The Reserve itself and the country north (Alberta) and west (B. C.) of it offer a large variety of big game and while the trophies to be obtained do not all compare with those to be had in the celebrated Cassiar, yet the district should prove very interesting to many because it is much more easily reached than Telegraph Creek. Specimens of mountain goat, mountain sheep, caribou, deer, moose, black bear and grizzly bear can all be secured in this district on one trip and at a comparatively low cost. Goats are very plentiful and very fine heads can be had. There are many sheep, but I have never seen particularly good heads. The caribou of the district do not carry antlers more than about 42 inches long. The deer heads are average. East of the Smoky, moose are numerous, a good head will show a spread of 50 to 60 inches, while the fine specimens go as high as 68 inches. West of the Smoky, the moose heads are considerably smaller. There are more grizzly than black bear and some fine specimens are taken out almost every year.

I had completed arrangements with Donald Phillips, the pioneer outfitter in the country under reference, to send me out for a six weeks hunting trip with one guide and one cook, when Mr. C asked to be taken along. I consented, although Mr. C had had no experience of the wilds nor of big game hunting. Unfortunately, the arrangement did not work out as expected. It was not found desirable for the guide to take the two of us out together and a second guide could not be obtained at short notice. The only alternative was for each to hunt alone on alternate days. This scheme was tried but abandoned because Mr. C was unable to get about safely by himself. As a result, I hunted alone most of the time, having the half-breed guide Adam Joachim of Entrance to myself on three days only. The cook, "Dad" Neighbor of Entwistle, was not available for hunting. Lone hunting is most enoyable, but extremely strenuous, and does not leave as much time as I like to have for photography and the study of the effect of game bullets on animal tissue. It had been my plan to do my own hunting, but let someone else attend to the skinning and carrying, but it was not to be.

The experience which suggested the advisability of C not hunting alone is extraordinary enough to be worth mentioning. In trying to reach a low gap in the hills, C had to cross a pine forest. There was about 18 inches of snow on the ground. After walking for a long time, he came to some fresh tracks which, he told us, he thought had been made by a bear or by a moose! Eagerly following this trail, he finally came upon a second equally fresh track which ran into the one he had been following. Thoroughly puzzled, he investigated at great length and discovered that he had mistaken his own track for that of large game of some kind. He had described a circle in the forest, struck his own track and gone over the same ground again. Another attempt resulted in a third and larger circle. Fortunately there was little wind, it was not snowing hard and he had the good sense to

backtrack, thus finally getting back to camp.

About noon of September 28, 1921, we left the train at the Mt. Robson observation platform (B. C.) some four miles west of Mt. Robson station and were met by Jack Hargreaves who was to take us to the Smoky, where we were to connect with Phillips' outfit. Starting at about four, we reached at nine p. m. a comfortable cabin on Mt. Robson Pass, 5,550 feet above sea level and within a stone's throw of the Alberta line which here coincides with the Jasper Park boundary. Having travelled due north, we were now 2,450 feet higher than the railway line. The pass was under 8 to 12 inches of snow. After hunting a couple of days in B. C. at the very foot of the magnificent Mt. Robson towering 7,518 feet above us, our pack train of 13 horses was again headed north down the valley of the Smoky. That afternoon, we met Adam and Dad and other guides bringing out three eastern sportsmen who had just concluded a very successful 30-day hunt. The first two turned back with us, after transferring our belongings to their own horses. Hargreaves returned to Robson Pass with the easterners. After a night in the open on the banks of the Smoky, from where we saw a number of goats and two caribou, at which we could not shoot because we were then cutting across a corner of Jasper Park, we reached, on October 2d, a nice cabin belonging to Phillips. This used to be a trapper's cabin until the Athabaska Forest Reserve was created, and stands near the Smoky, south of Bess Creek.

After a day's hunting, we made a side trip to the foot of Stony Pass, east of the Smoky and of Twin Tree Lake, returning to Phillips' cabin on the 7th. Here we found Phillips, who had been busy cutting out an old trail along the banks of the Smoky. Leaving on the 8th, we reached the mouth of the Muddy River on the 11th, after fording the Smoky many times and occasionally going through very deep water. We made two camps, Indian and Goat, on the way and hunted from each. Abandoning the Smoky and turning west, we followed the Muddy for nearly two days, then crossed it, working north until Sheep Creek was reached, when we again turned west, finally camping at the foot of Sheep Creek Pass on the B. C. line. We made three camps, Meadow, Sheep and Forks, between the Smoky and Sheep Creek, hunting from each. There was no snow on the banks of the Smoky, but we got back into it after reaching Sheep Creek and near Sheep Creek Pass it was fully 18 inches deep.

From Sheep Creek, we hunted into B. C., then after some very cold weather and more snow, retraced our steps to the Smoky, stopping but twice on the way and, of course, hunting from each camp. The first camp was just north of a cabin in brulé once tenanted by the Swede Kwass and the second close to the Muddy and within a stone's throw of another Kwass cabin. On October 26th, we were back at the mouth of the Muddy. After trying for sheep, deep snow prevented us from attempting the high passes we had intended to cross, so we moved to Grande Cache, a half-breed settlement further down the Smoky and just outside the Reserve. These settlers are eager to trade with the sportsmen who visit their district, and offer bear and othe pelts, moccasins, gloves, whistler robes and the like at astonishingly high prices. From now on we devoted our energies to the pursuit of moose, left the Smoky and following the splendid Government trails, made very treacherous and slow by ice and snow, we made camps at Muskeg River, Teepee Creek, Little Baptiste and Mobily Creek and reached Entrance, on the railway, on November 8th, having travelled in a southeasterly direction from Grande Cache. The horses were by now in very poor shape indeed; not only did we pick them up immediately upon their return from a very hard trip, but they had had but poor feed while with us, due to the prevalence of deep snow. The last few days were the coldest, the thermometer falling to about 5 above and we travelled through wind and snow practically all the way from the Smoky. We met two more hunting parties and, of course, came across a number of forest rangers. There are a number of very comfortable rangers' cabins east of the Smoky and most of them are connected by telephone with the Superintendent's house at Entrance. From Entrance, we went home by rail via Jasper, Edmonton and Winnipeg.

The Swede Kwass was a trapper who frequented the region before it was turned into a reserve and must have been quite a character. Wonderful tales are told about his exploits, of which the following are examples: Returning one evening to his cabin on the Muddy, he suddenly came upon a grizzly—the fact that Kwass at the time carried nothing but a .22 pistol did not disturb him in the least; he promptly shot the bear in the head. The animal tumbled over into the water. Suspecting that the grizzly was not dead, Kwass jumped in after him and held the bear's head under water until the animal was drowned. Kwass was scratched about the arms and chest, but otherwise unharmed and secured the pelt. On another occasion, in winter and while on snow shoes, he came across a moose in deep snow. Finding that the moose had difficulty in moving fast, he drove him to the very door of his cabin, where he stabbed him to death, thus economizing on cartridges and saving himself the effort of carrying the meat and hide a long distance over difficult ground.

On Mt. Robson Pass I saw a fine moose, and bear tracks were numerous, and we were told that goat is easily had. The hunting is all in B. C. and to the west. From Phillips' first cabin, goat is easily reached. Mr. C killed one here, firing fourteen shots to get it. Bear tracks are found all over the country, but some spots are particularly favored. The Stony Pass region offers goat, caribou, and is very well liked by bear. Indian camp affords an opportunity at moose, goat and sometimes sheep east of the river. From Goat camp, goats are within easy reach west of the Smoky. At the mouth of the Muddy, one can find moose and sheep, but the sheep do not come down this far until the end of the season. It is really a winter range for sheep. I saw twenty-seven of them on the hills north of the Muddy, but could not find a head I cared to go after. Across from this camp, but east of the Smoky, is a range of hills, the northern slopes of which are said to harbor some of the best sheep heads in the country.

From Meadow camp, I saw what I thought was a particularly good goat head, and while the rest of the party proceeded to the next camp, I stalked this fellow to within two hundred yards or so, having

(*Continued on page* 21)

Camp some ten miles up the Muddy.

Camp near Sheep Creek Pass.

Government trail east of the Big Smoky.

Reminiscences of an Ohio Rifleman

By W. H. RICHARD

Colonel C. B. Winder and Captain Richard, who made rifle history in Ohio and who were nationally known as Champion Shots.

AFTER the close of the Spanish-American War and with the reorganization of the National Guard, rifle shooting became recognized, at least in spots, as a somewhat desirable part of the Guardsman's training and Ohio, in common with some other States, decided to hold regimental and finally State competitions for its State soldiers.

In 1900 the first serious attempt was made to hold a State shoot wherein some twelve men were to be selected and known as the Ohio State Rifle Team—on paper. Medals were struck off to be given to the team as a mark of distinction and as such they were sure distinct all right. Nearly as large as the bottom of a tin cup, the first place being of gold and known as the Governor's Medal, the second being of the same design in gold and silver and the others of silver, there was no mistaking the recipient, especially as he was required to wear his medal on regimental parades and other dress occasions.

Two enlisted men from each company organization were ordered to the competition, which consisted of ten shots with the .45 Cal. Springfield at 200, 300, 500 and 600 yards on the old eliptical bull of the A and B targets. The scores were not high but no set of men ever worked any more earnestly to land in the desired dozen. The first two honor places went to two sergeants of the same company, and old Colonel Ames, retired army officer, who had charge of the competition declared that such a thing had never happened before and that it would never happen again. He was wrong, for the next two competitions brought out different winners from the same organization.

This first State shoot proved to be so popular that the program was enlarged upon for the next year wherein a few selected officers of the Guard were permitted to participate, and interest in target practice was off to a great start so far as Ohio was concerned.

At the time of which we write practically all of the noted riflemen of the country lived in the Eastern States. Creedmore range had nearly a national reputation, while Sea Girt was beginning to be heard from through the Middle Western country as a place where the super marksmen were wont to meet to compare their skill with the rifle. To us out in Ohio, Creedmore and Seagirt were a long ways from home, but nevertheless at the Adjutant General's Office the idea was conceived of sending an Ohio team to the Sea Girt shoot of 1901. No appropriation was available from State funds with which to defray the expenses of the trip, however a way was found to pay the railroad fare and to subsist the team. No pay was allowed and very little idea of what was required in the way of equipment and general expense was had.

This 1901 team from Ohio was the first of the States to cross the Alleghenies to participate in the so-called national matches of the East, and a greener or more inexperienced bunch of rookies had never left home on a trip of conquest than was this gang of farmers that landed unheralded on the green of the Sea Girt range, and that old-time close corporation of eastern shooters would not have been more surprised had a collection of Hottentots suddenly made their appearance in their midst. We were invited to wade in, that the water was fine, or words to that effect, and then left strictly to our own devices.

At this point we wish to state that in such observation as may be hereafter set down no personal disparagement is intended toward any individual or organization in any manner whatsoever. The writer realizes now more than he did at that time that the game was young then and that the actors in it had little thought of rifle shooting as a national development, and that the role they were playing in it was that of the shooter rather than that of the instructor. Some of those men at whom we looked in awe in that day and whose shooting kits we would gladly have carried for the privilege, later became personal friends. Some have passed on, and others are still with us, and to all of them we bow as the pioneers of the sport that bids fair to become our Nation's final security.

Our equipment consisted of a supply of "Krag" rifles and one thousand rounds of ammunition for same. None of us had even a speaking acquaintance with this combination, but were to develop shortly a considerable vocabulary appertaining to it. As for experience, we acquired that in chunks, smoothing off the rough edges by listening in on some of our idol's private conversation.

Practice tickets were secured and issued in limited (very limited) quantities, and by the time the first issue was gone our original thousand cartridges were likewise expended. Our team captain, Col. Adams, scraped up money enough to purchase from some wise gink at the range another case, and thereby hangs a tale.

We were green at the game and a much easier mark than was the regulation target of that day. That case of cartridges was loaded in tin colored cases, the powder being manufactured by a chap by the name of Peyton, at least it said "Peyton Powder" on the labels. The word has been a nightmare ever since. After a dozen or so shots the residue from this powder gathered in the bore until one could not push a rod through without cussing. We scoured with ashes, sand, emery, or anything else available and then boiled out some more fouling with a kettle of hot soda water. Peyton could have been boiled considerable in oil without regrets so far as we were concerned by the time that thousand cartridges were gone.

To add to our troubles, it developed that our new rifles invariably had a habit of requiring a sliding scale of elevations in firing a string of ten shots. One started in, say, with 500 yards elevation and by the time he had fired three or four shots the shots would be registering towards the top of the target. It was shoot and lower sight or the group would string out and leave that target mighty lonesome. We had no idea as to what was wrong, and for a time it seemed that we were in the midst of the original and only bunch of information tightwads. Our Eastern neighbors were about as loose as glue with their friendly advice. Celebrities there were present a-plenty, men of whom we had been reading for years, and who knew just about all there was to know about the game at that time and we sat on the fence and watched 'em go by reverently and with bared heads but that got us nowhere with our ballistic troubles.

One day, courage or audacity running high, we ventured to ask one of the most noted of the lot, a man then in the height of his fame as an authority on guns and gun making (not Harry Pope) why it was that our rifles carried such rotten eleva-

(*Continued on page* 24)

WHEN GUN MEN MEET

BY

Horace Kephart

Sandy recoiled in an attitude of shrinking horror.

THE McLeans had the best mountain farm within ten miles. It adjoined three poor farms whose owners, the Hensleys, the Birches and the Hollicutts, were never satisfied with their boundaries. Old Man McLean had three lawsuits running from court to court in which those boundaries were contested.

Sally McLean had run away and married "one o' them low-down radical Hensleys," and her husband "made a fool and a slave of her." Bill McLean gave this Hensley a public thrashing, and got shot from the brush for it. Then Cory McLean killed a Hollicutt, and he still had a year to serve on the chain-gang.

Nothing remarkable about this, in the Smoky Mountains, but it explains why Sandy McLean was the only son left at home, and why it behooved Sandy to keep his eyes skinned.

The aforesaid Sandy, ever since he had been big enough to wear galluses, had practiced the art of shooting straight. In this he had been encouraged by Old Man McLean counting out a few cartridges at a time and giving Sandy a licking for every one that failed to bring home some meat. This was the rifle stage of the lad's education.

Sandy never was trusted with a pistol until he got big enough to earn one for himself. At seventeen he made a full hand at logging, went to the camps, and thereafter he had a gun, and ammunition to burn.

Sandy prided himself, at first, in "shooting a revolver like a rifle." He had a long-barreled .38 Special, sighted to suit him, with the trigger-pull eased down and "slick as soap." He would hold that gun two-handed and knock a squirrel out of a tree, or behead a pheasant with it. He would set up a tomato can on the gate-post, fifty-two honest paces from the porch, and bore it twice out of three times.

But this was only hunting practice and exhibition stunts. Man practice is something else. As Sandy said: "Them low-down radical Hensleys, and thievin' Birches, and sneakin' Hollicutts, won't come up man-fashion and face-to-face. They're tricky; they're snakes in the grass. You can't fight a man fair and squar who'll shoot you from the bushes."

And so Sandy practiced, in the secrecy of the big wild woods, certain tricks of his own. He got another gun, a .44-40 double action New Service, that nobody but himself knew that he possessed. He bought it from a mail-order house in a distant city, and had it shipped by express, along with a full case of smokeless cartridges with hollow-point bullets. He went miles back in the big timber and practiced the quick draw, the quick drop, the quick repeat. Nobody knew he was doing this. Success in mountain warfare hinges on "the surprise." Nobody knew about the quick-draw shoulder holster that he designed and made for himself, nor how he arranged his shirt when he carried the gun under his shirt instead of wearing a coat. He would not have revealed these things to his own brother.

There were a lot of killings in their part of the country, and Sandy was present at some of them. He observed keenly the technic of every gun-fighter. On the witness stand he preserved a calm pulse and a poker face. He could lie most plausibly for a friend, or against an enemy, and get away with it. Then, one day, he had to kill or be killed, himself. He got away with that, too, and came clear, on the score of self-defense; but it cost Old Man McLean nearly a thousand dollars. The head of the house paid it cheerfully, and patted his offspring on the head.

Sandy trained himself to be ambidextrous with the pistol, and to shoot pretty straight from hip or breast when there was no time for aiming. He often carried, as an auxiliary a sawed-off hammerless .38, in his side trousers pocket, where his hand always rested on it when he stood in an innocent loafing attitude. This he could flash instantly, while the enemy had his eye on the bulge under Sandy's left armpit.

If Sandy had ever talked to himself about gun wisdom (he never would do so to anyone else, of course) it would have run something like this:

"The trick of killin' is to git the advantage. On anything like an even break, the advantage is with the man who first makes up his mind to shoot.

"The Golden Rule is to git thar fustest with the **mostest hits.**

"At close quarters, shoot for the face, if you've time to stick out your arm. If

you don't hit with the bullet, you'll blind him, anyway.

"If there ain't time to raise the gun clear up, shoot for the stummick. A shot in the stumick ginerally is a knock-out. Then if you happen to overshoot, you'll reach the heart; but if your undershoot, chances are, he'll git you, and do his own dyin' next day or mebbe not at all.

"This yere fine shootin' at long distance ain't no account. I ain't never seed no gun-fight at more'n twenty yards: ginerally it's ten or less. Fine shootin' is slow shootin', and that's suicide if the other feller's spry. When you can hit your hat every time at fifteen yards, and do it quick, with a real he gun, then you're a he gunman. It ain't so damned easy as it looks, when the other feller's hand comes up a-smokin', too.

"Target sights ketch in duds or holster. Too long a barrel is a slow draw. A gun that don't balance is slow; so's a grip that don't fit, or a trigger that drags. These things count, but fancy works don't. It ain't the name on the gun that does the hittin', nuther. I don't fool with no underloads; they alter the sightin' of your gun and git you in a bad way of holdin'. I can afford two dollars a week for full loads better'n I can afford a wooden overcoat.

"Small calibers is pizen. You might drill a man through and through with one o' these solid thirty-twos or thirty-eights, and him not know it till the fightin's over and he goes to blow his nose. I've done seed it my own self. Metal jacketed bullets is no good, no matter how big they are, in pistols. Soft points nuther—they don't flatten from pistols like from rifles. The only sure bet is a big lead bullet with a hole in the front end that is bound to make the ball mushy-room. It tears meat, and won't glance much from a bone. It makes your man go 'Uh!' and look dumbfoundered; then he sags at the knees and goes down very quiet like.

"I don't confidence these automatics none. They won't allers feed, but hang up. If a revolver fails to bust the cap you just work your finger wunst and there's a fresh cartridge thar for business; but an automatic takes two hands to git in action again, and mebbee you ain't got hands enough right then, nohow. 'Nother thing, when you shoot an automatic the empty hull flies clar out on the ground. You go away forgittin' it, in your excitement, and thar the damned thing lays, ready to 'criminate you before the curoner. No, sir; gimme a old reliable revolver every time."

There were other rules of the game that Sandy never formulated, for they are self-evident to every highlander. He had learned them when he was too little to remember. For instance, to be of much use in mountain war, you must be quick and sure with all your senses; quick to see "sign" of an enemy, quick to hear a movement behind you, quick to smell smoke or still-slops, quick to taste drugged liquor, quick to feel treachery in a handshake. And you must be nimble on your feet, poised and alert at all times. Sandy had practiced his "whirling stunts" a thousand times, drawing the gun and firing to the rear in one second or less.

But with all this exercising and plotting and observing, there was one trick of self-defense that Sandy McLean never thought of. He never studied how to best a man who would try to rob him.

The reason? Well, there never had been a case of burglary or highway robbery in all that mountain country. "The like o' that is too low down," Sandy would have said—"too low down for even a Hensley or a Birch or a Hollicutt."

Mountain folks, despite their frequent killings, are a religious people; and high crimes against property are, they say, downright irreligious.

Of course, Sandy had heard of burglars and highwaymen up North and out West. But he said: "Them folks ain't civilized; why, they're plumb heathen!"

So, if the prophet Ezekiel had appeared out of thin air, before Sandy McLean, and had forewarned him that his next shot would be at a hold-up man, Sandy would have stared at the apparition and answered: "Now, 'Zekel, I reckon you-uns ain't right well acquainted round hyur."

So, too (while we shift the scene quickly a thousand miles), we may remark that if the Gypsy Queen, reading the cards for Tom Marino, burglar and gunman of the East Side, had found in them that Tom was to match wits with a southern mountaineer, Tom would have scornfully asked: "What do you mean, mountaineer? One o' them bush leaguers? Fool, don't you see some class about me? I go up against the real thing."

And he did go up against the real thing. He killed a police captain. With two pals, he had blown a safe, and they were busy with the swag when the captain and several patrolmen surprised them. Tom shot the cops' leader, sprang into a passing car, jammed his pistol against the chauffeur's side, made him drive several blocks at top speed, jumped out, doubled and twisted, got another car, and escaped from New York. But he was still up against the real thing. Every police force on the continent would thenceforth be on the lookout for the thug who had murdered a prominent member of their own profession.

So Tom had to keep clear of cities. The idea of lying low in some rural place, vegetating in a nest of hicks and pining his heart out for the city, was gall and wormwood; but it was that or the electric chair for Tom Marino.

North and West were closed to him; for he was known from coast to coast. South it must be, where he had never been. And southward he went, by devious ways, dodging all cities, boring deeper and deeper into the thinly settled hill country. That is how he came to Bucknerville.

Bucknerville is a "city," by law, though it has but eight hundred people. It is the capital of a district that is mostly made up of high mountains and tall timber. There is a courthouse, a jail, a bank, a garage, and a paved main street. There are three hotels, four churches, a Masonic hall, and twenty general stores that are practically all alike. An evangelist was holding a revival in a big tent when Tom arrived. Every afternoon and night two-thirds of Bucknerville went to the services, and every store in town was closed.

Tom endured two days' stagnation at a hotel. Then he shifted to a lodging place frequented by lumberjacks and other tough citizens who spoke a language more familiar to him, in spots, than the revival talk of the streets. But still he was bored stiff. Bootleg liquor failed to cheer him up. He got into a poker game and was cleaned out by a bunch of roughnecks whom he dared not tackle single-handed. They plucked him of all but a few dollars. Then something had to be done in his line.

First, he got a detailed map of the country and studied it. Then he hung around the bank corner and planned a night attack. It looked easy. The only policeman in town went to bed regularly at eleven o'clock.

But as he stood there apparently idling before the open door, he saw a bent old man go into the bank, draw a paper from his wallet, and present it to the cashier. The cashier counted out to him a thick packet of bills. The old man went over them twice, with trembling hands, then tied them up in his wallet, stuffed the treasure into his inside waistcoat pocket, came out, mounted a mule, and rode off.

Tom Marino sauntered away to the garage. He hired a car, saying he had to run up to the construction camp on the river road and that he would drive for himself. This was a customary procedure in easy-going Bucknerville, and no questions were asked. Tom rolled leisurely away in the direction the old man had taken.

He soon came in sight of his quarry jogging along at a trot. Thereafter he moved slowly, keeping out of sight as much as he could, favored in this by the winding road. When he heard cars coming he would stop and fool around the machine as if locating trouble.

Three miles out of town the road wound up the side of a hill amid thick woods. It was a good place. Tom shot ahead, caught up with his victim, forced him against the cut bank by apparently awkward steering, threw a gun on him, and made him dismount and deliver. The mule ran away. The old man's astonishment was beyond speech. The business was over in a minute, and Tom sped away at full speed, chuckling at the ease with which the boob had been handled.

There was a telephone line along the road. Marino calculated that it would take the old fellow ten minutes to get back to the first telephone. So, for the next ten minutes he drove as fast as the snaky road permitted. That brought him to a sharp curve on the verge of a precipice by the riverside. Here he leaped out, sent his car down over the bank, and saw it tumble over and over and go to smash at the water's edge.

Pursuers would take this for an accident in his haste to make a getaway. They would waste time here, looking in wrong places for sign of what had become of him.

Marino climbed the steep hillside on his left, taking pains to obliterate the footprints that he left here and there. At the top of the ridge he stopped to regain breath and survey the country. He had a good dea of his position, from prevous talks with the lumberjacks. The country to the north was farmed for about five miles along a creek valley, the enclosing ridges being all in timber. Beyond that spread of valley there was nothing but forest, uninhabited, to the top of the Smoky divide, which was the State line, about twenty miles from where he stood. Southward, across the river, there was another range of wild mountains. There was a bridge just beyond the scene of the wreck. Pursuers would think it likely that, if he was uninjured, he had crossed the bridge, and that if he left the road at all he would go into those southern hills. But they would be more apt to infer that he had fallen out of the tumbling car into the river and had been swept away by the current.

Tom set out northward along the backbone of the ridge. There was a faint cattle trail here through the timber. He figured that he could reach the top of Smoky before nightfall. It was August, and a bivouac under the stars would be no hardship. Next day he could descend along a a similar abutting ridge into Tennessee and reach a railroad. There were no roads or telephones across the Smokies, and no chance of the alarm spreading into Tennessee within twenty-four hours.

He legged it rapidly for a while, but gradually slowed down. The trail was overgrown with bushes in many places. The devilish greenbrier caught his legs and im-

peded him. The top of the ridge was wavy. Often he would make a hard climb and find a swag or gap on the far side. So it was up and down, up and down, with an infernal lot of climbing for the actual elevation gained. Still, in two hours he was probably four miles back from the river and nearly two thousand feet above the only house in sight.

By this time he was well winded and sweat was streaming from him. He cursed the country, cursed his lack of food, and cursed the chill night ahead of him, alone in this silent wilderness. But he counted the money he had stolen, nearly three thousand dollars, patted it with blasphemous approval, and took a sniff of "snow" from a vial that he always carried. This chirked him up, and he set forth again with renewed determination.

He was going down into one of those swags of the ridge, legging it with long swift strides, when a tall young countryman stepped noiselessly out from the bushes and confronted him.

Tom checked himself with suspicious suddenness. Sandy McLean eyed him with cold appraisement. The robber started forward again as though to pass him, with a gruff "Hello." Sandy saw something mean in the fellow's scowl, and he made no move to give room. They were in a narrow place. Tom had to stop again, or butt right into the fellow. He was in no mood to be stopped or questioned, and he flared out: "Get you of my way, you —— —— ——."

A southern mountaineer will sometimes stand a certain amount of cussing, if it is the right sort. But there is one sort that he will not take from anybody, under any circumstances whatever. If his maternal ancestry is impugned he will fight instanter, no matter what the odds. Sandy saw red.

Marino saw it, too. He blazed. No hick should stay him for a moment. He had no time to waste on pugilism. He pulled his gun.

Sandy recoiled in an attitude of shrinking horror. He threw up his left arm awkwardly, palm outward and fingers spread, as though to push away some frightful vision. With the same motion he twisted so that his left side was presented toward Marino. His right hand had started up, too, but the twist of his body brought it naturally toward the left armpit. Instead of rising higher, it shot under Sandy's coat, snatched out the .44, leveled it athwart his body, and fired. It was all done in half a second, before Marino could detect the deception and react to it. This was Sandy's way of making the quick draw, while at the same time confusing his antagonist as to his intention.

The terrific shock of the expanding bullet registered for an instant in the robber's look. His lips opened, but nothing came from them but a gasping "Uh!" He swayed, his knees gave, and he quietly crumpled down.

A New Telescopic Rifle Sight Mounting For High Velocity Rifles

By CAPT. G. L. WOTKYNS

SINCE the advent of the high velocity small-bore rifle the question of a suitable mounting for a telescope sight has proven a most vexing problem and many have been the attempts to solve it. Some of these mountings have given fairly reliable results at first, only to break down miserably after a few hundred rounds or sooner. This article deals with the rigid type of mounting, one that retains the telescope so that it does not slide forward upon recoil, but holds the glass in a vice-like grip at all times.

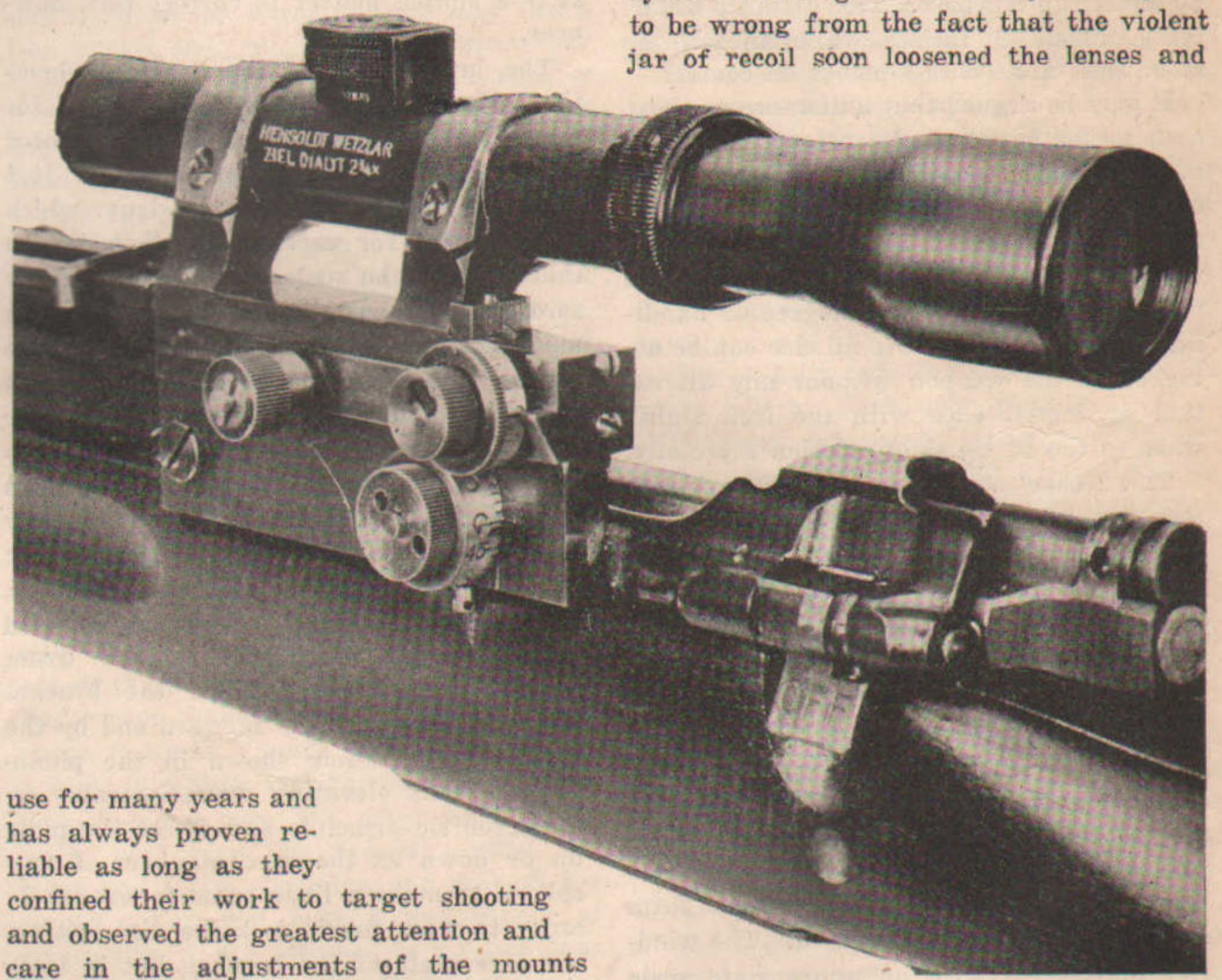
Our Government has experimented at various times with this problem but up to the present moment has not evolved a really satisfactory bracket or mounting for the rigidly attached telescopic musket sight. At this writing there are being conducted a series of experiments that may lead to a satisfactory solution of this problem, but all that can be said just now is, that when the results of the experiments are complete our riflemen will have a first-class and reliable telescope mounting with a glass that is suited ideally for the picking off an enemy with neatness and dispatch.

During the outset of the war the Germans were very much in the ascendancy as regards this form of sighting and the Allies suffered to a serious extent. The British lost some of their most skilled and valuable men through their lack of properly meeting this very important and special feature of military small arm equipment. However, during the latter part of the war they more than made up for their early mistakes in this direction and repaid with interest their costly mistake.

American riflemen are more familiar with a type of mounting that has been in use for many years and has always proven reliable as long as they confined their work to target shooting and observed the greatest attention and care in the adjustments of the mounts themselves; I refer to the sliding tube system as exemplified in the Winchester and Stevens telescopic sights and mounts. These instruments have, in the main, given very reliable results, but they lack the qualities we now deem so important, *i. e.*, field and light, in their optical system; compactness of telescope with ease of adjustment and the ability to retain this adjustment under the most trying field conditions.

There really seems no good reason why a telescopic sight can not be made so strong and sturdy in its self, or the mounting so simple and rigid that it will not stand up under war and hunting field conditions.

The Continental system of mounting the telescopic sight has always followed the lines of the rigidly mounted tube. This system was long considered by our experts to be wrong from the fact that the violent jar of recoil soon loosened the lenses and rendered the instrument worthless and the bracket holding the telescope was so clumsy, massive, and perched the tube so high upon the rifle that a comfortable shooting position was impossible except perhaps in the off-hand position.



The Noske side mount

The early objections to this rigid method of mounting the scope were usually well founded but of late the improved methods of lens cell construction coupled with a bet-

ter understanding of the problems involved in this question have been the means of evolving some splendid instruments optically while a mounting that has recently been manufactured now bids fair to rival in mechanical design and reliability the best we have in optical systems.

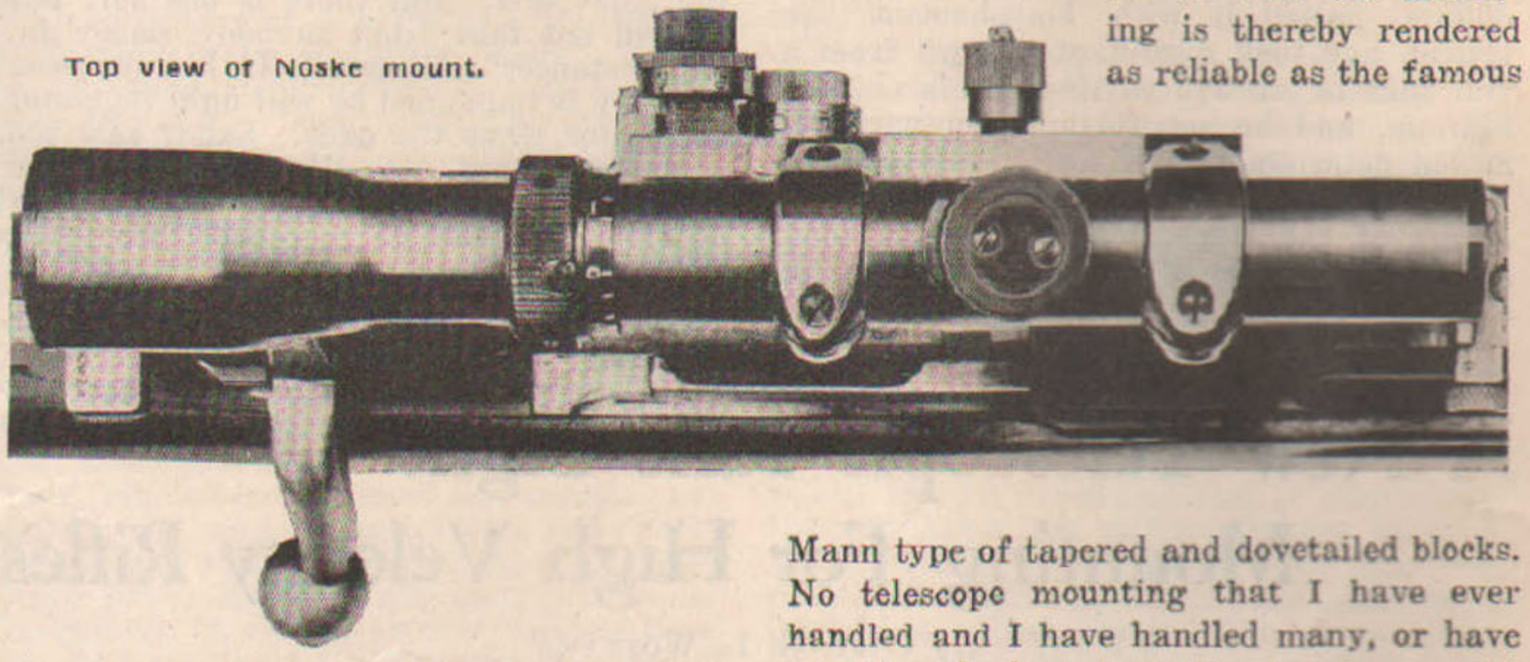
This mounting, known as the Noske telescopic rifle sight mount, is made by R. Noske, 35 Montgomery Street, San Francisco, California, and was first put out to handle the Hensoldt telescopic rifle sights in the various powers made by that famous firm of optical manufacturers. A very good idea of the mounting and glass can be had by observing the plates herewith. This mounting in particular was made for the service rifle (Springfield), and is the latest attempt by Mr. Noske to tackle this problem. At the present time the glass with its mounting and the rifle are at the Frankford Arsenal.

This mounting is of the short-base type and for that very reason it is vitally necessary that everything be of the soundest design, for your short base mount multiplies any error or play in the adjustments by just twice that of the standard distance between centers of the typical mountings used by American rifleman. This distance usually is about 6 inches while the Noske mountings are about 3 inches on centers.

It may be argued that a distance as short as 3 inches is not good construction, but it must be remembered that we are trying to evolve a mounting that will not clutter up the rifle with a lot of hardware, that is very compact and neat, will not add to the rifles weight to a marked degree or handiness in service and above all else can be attached to the weapon without any alteration or interference with the iron sights when in the battle sight position especially.

This Noske mounting of the military pattern has, as can be seen, two drums to the rear of the mounting, one over the other. The upper drum is for windage and can be readily adjusted for points as we know them on the Springfield service sight. After you have made the required adjustment the little outer knurled head is unscrewed somewhat till it takes up all lost motion that may occur at any time in the adjustment and completely locks the adjustment against any and all movement. It does this too and more effectually than any other form of adjustment I have ever seen. The windage dial is cut with an appropriate scale that gives four points, right or left, although one can have more windage if it is desired. Personally, I believe this is sufficient on a telescope, for one is better able to hold off an object with a glass and do so with a degree of accuracy not possible with any other sort of sighting device. In connection with this windage adjustment there can be seen a small block of steel just to the rear of the rear clasp of the bracket through which the tube of the telescope passes. This little block has cut upon its face, in clear view of the rifleman, a series of lines which indicate the actual movement made to the right or left for windage, and is constructed so lateral zeroing can be made easily so that your windage zero reads zero and not some other thing to which you must add in one instance or deduct in another. This windage adjustment is also made with clicks which read one-half-inch per hundred yards of range although I think these are rather too fine.

Top view of Noske mount.



It is a simple matter to correct this, however.

The lower drum is the external elevation adjustment and is cut and adjusted for minutes of angle readings. It will be noted that there is a little capstan screw just below this lower or elevation drum which is put there for zeroing the elevation so that zero on the scale of the drum means zero and not some other figure to which must be added the true angles of departure for any range you wish to fire over. In this case you would probably zero your rifle for 200 yards and then all you would have to do would be to add the required minutes of angle necessary to hit the bull at any given range and move your drum to that reading, fire your shot and record a bull. The drum is locked by the outer knurled headed screw which clamps the drum tightly against the face of the bracket which is pivoted at the forward end by the heavy slotted screw shown in the photograph. This elevating drum operates on the eccentric principle and forces the plate up or down as the case may be. I was obliged to make a little spanner wrench in order to more firmly lock the dial against the face plate of the bracket, but in later mounts this is to be taken care of by providing a simple means for quickly and positively performing this operation. This external adjustment for elevation is very satisfactory, accurate, easily read and a very great convenience indeed. It appeared to work well and never changed adjustment when thoroughly clamped no matter how powerful the load or how many shots were fired.

The forward and smallest knurled headed screw is one of the most important features of this interesting mounting and to which it largely owes its remarkable success. This device is nothing more or less than a tapered pin of hardened steel which fits or bears in a tapered groove and when it is thrust home and tightened, so thoroughly cams the mounting attached to the glass to the mounting or plate attached to the rifle, that the two are virtually welded into one as it were. It makes no difference how much wear there may occur incident to service, this little tapered pin will pull it all out and the mounting is thereby rendered as reliable as the famous Mann type of tapered and dovetailed blocks. No telescope mounting that I have ever handled and I have handled many, or have ever heard about had this feature so well worked uot. It is a vice action, durable and highly efficient.

That part of the mounting to which the glass is attached and to which the taper clamping pin and windage heads are afixed is cut with a female dovetail section, while the base which is attached to the rifle and to which the elevation drum is fixed is cut with a male dovetail section. By unscrewing the little clamping-headed screw—it can not be entirely detached from the mount because it is prevented from doing so by a little cotter pin—and pulling back upon the mount, it can be instantly detached from the rifle and can as instantly be replaced.

The distance between the pivot or forward portion of the movable base and its rear portion where it bears against the windage screw is about three inches. This movable base should not be confused with that portion of the base of the telescope which is removed from the rifle, but is to be likened to the movable base of the rear sight of the service rifle (Springfield), which it very closely resembles. This movable or windage base is pivoted at its forward end to the portion of the base which is attached at will to the plate which is fixed to the left side of the receiver of the rifle. The fitting of this movable base is exceedingly good and its bearing where the windage screw operates is heavy and strong. There has never appeared the slightest sign of rocking or movement of any sort, but if any should occur it would be an exceedingly simple matter to overcome it by the addition of a screw of large diameter which could be given a slight turn, enough to cause the two bearing surfaces,

(*Continued on page* 21)

How to Make and Insert Cross Wires and Post Reticules

By J. W. FECKER

ONE of the most vital parts of a telescopic sight are the cross wires or other mark used to center the image in the field. If they are not satisfactory, the entire value of the instrument is lost, for its accuracy depends to a great extent upon the clearness of these sighting marks, and their effect upon the shooter's eye.

There is no sighting mark which can be universally used. What is very well adapted for one particular shooter's eye may be most unsuitable for the next person who tries to use it. In like manner, there is no sighting mark which is equally well adapted to indoor target shooting, outdoor range shooting or hunting in a dim, poorly lighted underbrush.

For these reasons a shooter will often find the standard factory reticule unsatisfactory and is often tempted to try to change and make one to suit his own requirements, especially when the factory can not supply him with what he desires. He can readily do this if he has more than a little patience and is not tempted to give up too easily.

There are various materials which can be used for cross wires. Very fine wire can be had in copper, silver, platinum and tungsten. In wire thinner than one thousandth of an inch diameter, the copper, silver and platinum tends toward a crystaline structure and is likely to break, when used on a rifle with heavy recoil. Fine spun glass can also be used, but it is not as good as metallic wire. Tungsten wire can be obtained as fine as one-quarter of a thousandth of an inch in diameter, and it is remarkably strong. The one thousandth tungsten wire will support 3 to 4 ounces without breaking. Silk fibre and spider threads are very good for cross wires. Spider threads are as elastic as rubber bands, and when properly inserted will not shoot out on any rifle.

The spider threads are not those taken from the web of the spider, but from its cocoon. Late in August and early in September the large yellow field spider with a black cross on its back spins its cocoon in the fields. It is most frequently found on golden rod and around blackberry bushes. This cocoon is about three-quarters of an inch in diameter and is a round brownish ball with a rather hard crust on the outside. It should be cut open and thoroughly steamed to kill the eggs inside. Between the egg sack and the outer shell is a fine cushion of reddish down. This is the part to be used for cross wires.

The tungsten wire can be obtained from any maker of incandescent lamps. Fine silver and platinum wire can be obtained from Baker & Co., Newark, N. J.

The reticule cell should be thoroughly cleaned before starting and should have the scores cut in for locating the wire. If no scores are cut in the cell, they can be cut in the following manner: Upon a large white sheet of paper, draw a circle 12 to 15 inches in diameter, and accurately lay off 4 points on circumference exactly 90 degrees apart. Put a pin through each point and stretch a fine thread over each pair of diametrically opposite pins, so as to give you two fine threads exactly at right angles to each other. Slip the reticule cell under these threads and accurately center it under the intersection of the threads using your eyepiece or other magnifier to set it as close as possible. With a fine needle make a dot where each thread crosses the edge of the cell, and take a very sharp knife and lay it diametrically across each pair of these points and press down, so as to leave a very fine sharp line across the cell. Use your magnifier freely to see that the knife edge is exactly over each dot before you bear down to cut the score. The scores should not be deeper than 0.003 to 0.005 inch.

In a factory where reticles are made, the reticule is centered upon a stud, mounted on an index head, and the scores are cut with a very fine dividing cutter and accurately indexed so as to be exactly at right angles.

If spider line or silk fibre is to be used, first prepare two bent wires, a long black hair pin is just the right weight, by putting a small ball of beeswax on each end and spreading them so that the distance between ends is about one-quarter inch greater than the diameter of the reticule cell. With a long needle, pick out a loose end of thread and take a hold of it, letting the cocoon hang down. Wrap this end about 6 times around one waxed end of a wire, then turn over the wire so that the thread comes over the other end of the wire, and wind the thread around the other end about six times, and pull off the cocoon. You will have a fine thread of spider silk, firmly fastened to the two ends of the hairpin. It should now be hung some distance over a small vessel of boiling water, so as to steam the thread and make it absorb all the moisture it will hold. If the thread is not steamed, it may slack up later on a damp warm day. After the thread has been steamed 10 to 15 minutes, take the hair pin by the back end, and slowly and carefully lay it over the reticule cell so that the fine thread will fall as nearly as possible in one pair of scores. Allow the back end of the hairpin to rest on the table, but the two open waxed ends should not touch the table. They must hang free, supported by the thread laying across the reticule cell. If they touch, place coins under the cell until the ends of the pairpin hangs free. The weight of the hairpin puts just sufficient tension in the thead.

With a magnifying glass and a long pointed needle push the thread over until it drops into the scores. When it is in both scores, place a very minute quantity of thin shellac or collodion in the scores to stick the thread down. The less material you use to stick the thread in with, the quicker and more securely it holds the thread. A large drop of shellac will dry slowly, and contracting as it dries, it will pull the thread with it until it breaks. The least possible amount of shellac is the best. After ten minutes cut the ends of the thread, and place a new piece on the hairpin and put it in the other pair of scores.

Fastening the spider silk on the wire holder and laying it in the scores requires a little practice and patience, so do not be disappointed if you break the first dozen. Once you have it cemented on and dried you will have the finest and most uniform wire. This spider silk is about one ten thousandth of an inch in thickness, and when properly focused in the eyepiece it is as black and opaque as any heavy wire.

When using metallic wire, it should be soldered in the scores with a jeweller's blow pipe, and placed in tension, by hanging a small weight on each end, the size of the weight depending upon the strength of the wire.

Care must be exercised to heat only the point where the wire touches the cell, very quickly, for if the entire cell becomes thoroughly heated before the solder sets, the wires will be slack upon cooling.

Tungsten can not be soldered or brazed, and only spot welded with great difficulty even with elaborate welding apparatus. The only secure way to fasten it in place is to clamp it under a washer, held down by a small watch screw. After the screws are all turned down securely and the wire firmly held, put a little shellac over the wire and screw-head as an added precaution. Mounted thus tungsten wire will stand any shock. The only advantage tungsten wire has over spider thread is that it can be obtained in a variety of sizes, while spider thread is pretty uniform in thickness.

The making of a good post, either flat topped or pointed, is an equally ticklish job. Post reticules are made of thin steel or hard brass wire. The thickness depends upon the focus of the eyepiece. For short focus eyepieces, which magnify highly 0.005 to 0.007 of an inch, is about right. For long focus eyepieces with low magnification, 0.010 to 0.015 of an inch gives best results.

The first operation is to thoroughly straighten the wire. Drive about a dozen or fifteen 1½-inch nails into a board about

(*Concluded on page* 25)

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Sacrifice and Rifle Shooting

EVERY rifleman who attends the National Matches this year at his own expense is a real booster.

It does not take a great deal of self sacrifice for a man to follow the shooting game when everything is made easy for him—transportation and subsistence paid and rifles and ammunition issued without cost—except in such cases as it is difficult for the shooter in question to spare the time away from the occupation on which he depends for a livelihood. Usually the shooter whose personal affairs can be arranged is only too willing to help form a civilian team, since a sojourn in a National Match camp affords a vacation which particularly appeals to the marksman.

The civilians under canvas at Camp Perry this year, however, will unmistakably identify themselves as boosters of the game—men who have been willing to come out during the "off year" when government appropriations were insufficient, and by their participation in the Matches hold up the civilians' end in the big competitions.

All of which naturally suggests the question: How much self sacrifice is a shooter willing to undergo that he may indulge in his favorite sport? From C. C. Finn, of the Seattle Rifle and Revolver Club, comes a bit of testimony which is evidence that the breed of boy who counted no sacrifice too great if through it he could obtain a real rifle and whose prototype has flourished among American youths, since pioneer days, still persists.

"Most of the best shooters of rifles," says Mr. Finn, "are usually fellows with little money, who make rifle shooting their one recreation. We have a lot of young fellows from college in our club who literally go without eating to shoot. One kid turned me over a cheque for $50.00 some time ago, signed by his father, and I asked him if it was not his expense cheque for meals for the month. He said it was, and I asked him how he was going to eat for the long thirty days until he got another cheque, and he said that the other boys at the 'dorm' would stake him because 'being broke is pretty usual in our bunch. I got him to put off buying a rifle for a while, but he came back the next month with another cheque and said that he was fixed so he could spare it, so I sent the money on. The rest of us, with a few exceptions, cut a corner here and there so we can have cartridges and new barrels and pay range fees, and because it is a little pinch to keep in the game, we do shoot pretty well."

You who can afford all the powder you can burn and a new tube to burn it in whenever you so desire, think over the case of the Seattle student. Do you love rifle shooting as much as he?

"Bon Voyage"

HERE'S the best of luck to the United States Rifle Team of 1922. May they, at Milan, reap the reward of their undoubted skill!

With the team which sailed August 23 on the *President Adams* goes the good wishes of ten thousand American riflemen who know that our National repute as marksmen could not have been placed in better hands. If the team is victorious it will be a clean and sportsmanlike victory; if our marksmen are defeated, it will not be because they did not give the best that was in them.

The widespread response to the invitation to American riflemen to contribute to a fund to enable our representatives to appear in a proper light before those of other nations was a very material manifestation of the good will of the shooters at large toward the team.

It is unlikely that a team ever before sailed under more auspicious circumstances, not the least of which is to be found in the team personnel.

Major L. W. T. Waller, Jr., is singularly well fitted for the team captaincy, not only by virtue of his own training and ability as a rifleman, but also by reason of a personality which logically inspires loyalty from those who work with him.

In Lieutenant Commander C. T. Osburn, the team has the advantage of a splendid coach—a seasoned rifleman who not only knows the rules of the game, but who possesses a degree of skill which enables him to shoot shoulder to shoulder with the men he is coaching—this latter ability no small item in inspiring confidence among the men.

The shooting members and alternates and other officials of the team are no less worthy for the work they have undertaken.

Lieutenant Commander E. E. Wilson, one of the old Naval Academy riflemen who finished tenth in the tryout is the Adjutant of the team.

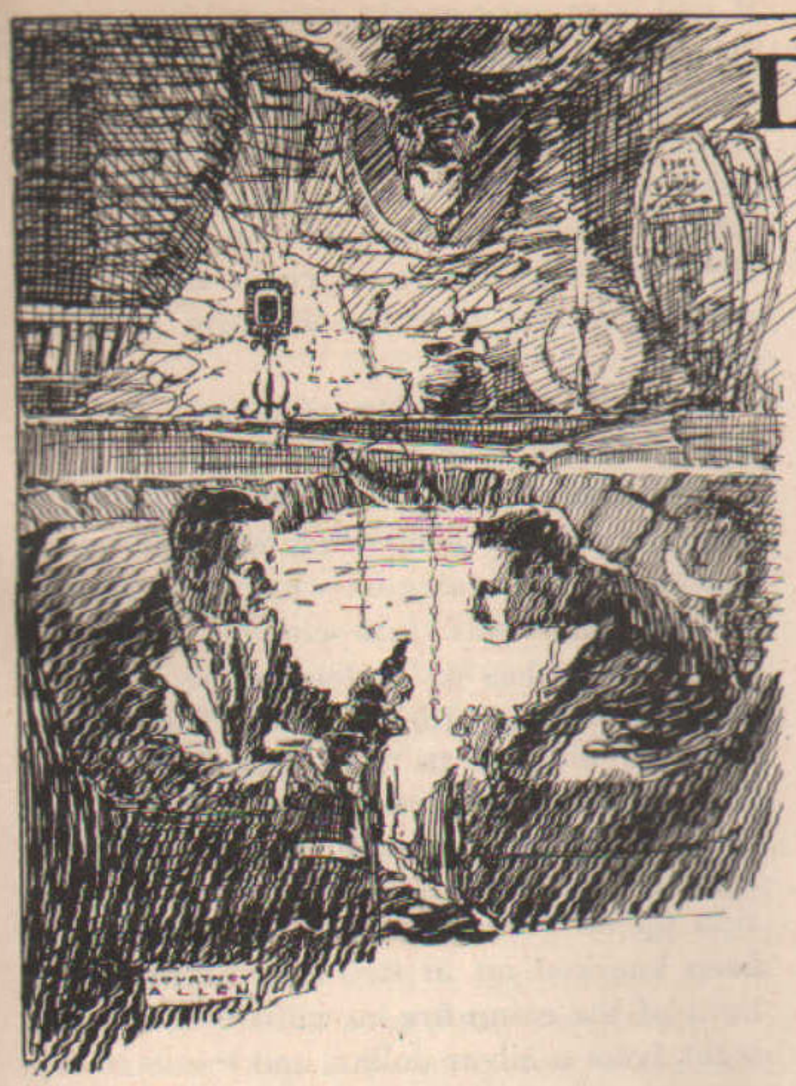
Walter Stokes, the only civilian representative, is the 1921 Individual Champion, and goes over not only to shoot on the team, but to defend his title.

Major J. K. Boles of the Field Artillery, who went to Quantico from his station in Iowa at his own expense and shot his way into third place in the tryouts, is a splendid and seasoned shot, formerly one of the 7th Regiment of New York riflemen, and one of the most popular men in the outfit.

Lieutenant Commander A. D. Denny is a veteran of the Naval Academy rifle team, was a member of the Pan-American Team in 1913, and won the President's Match in 1909.

In Captain Joseph Jackson, Marine Gunner C. A. Lloyd, and Sergeant Morris Fisher, the team has three seasoned match veterans, one of whom, Fisher, was a member of the 1920 Olympic Team.

It is to be regretted that Larry Nuesslein, who won second place in the tryout, was not able to accompany the team, for a man of Nuesslein's calibre means many points to a team.



DEN TALKS

By

Ernest Coler

Pitfalls in Pit Work

ONE untrained target pit attendant can do more to spoil the temper of the firing line, thus ruining the day's sport or the match, than a whole caseful of war-time ammunition that splits its necks or blows out its primers.

The trouble often comes from the fact that the chap in the pit, unfortified by proper preliminary instruction, attempts to use his eyes where he should use mainly his ears. "Bang!" goes the shot. But the target on which you expect to see a joyful "five" remains unpulled. The marker in the pit, relying on his sight instead of on his hearing, tries to locate the shot hole from below, on a target high above him.

After a while, when he sees the hole, he pulls the frame and in leisurely fashion proceeds to transfer the marker into the new hole and to paste up the old one. Then, as a final operation, he signals the value of the shot to the firing line by means of the disc. Five hundred yards away and safely out of earshot the marksman has turned blue in the face, his eyes are tired from having been riveted on a target on which nothing has happened and much time has been wasted during which his target partner might have fired his shot.

Now particularly where there are a number of targets in close proximity it should be brought home to the markers that the easiest way to ascertain whether a target is hit is to listen for the sound of the bullet akin to the crack of a whip. The marker who keeps his ear cocked in the direction of the target will never have trouble in telling whether his own or his neighbor's target should come down.

It will be found that much of the occasional delay can be cut short if the executive officer makes it a point to drum it into his markers that the work should always take the following rotation:

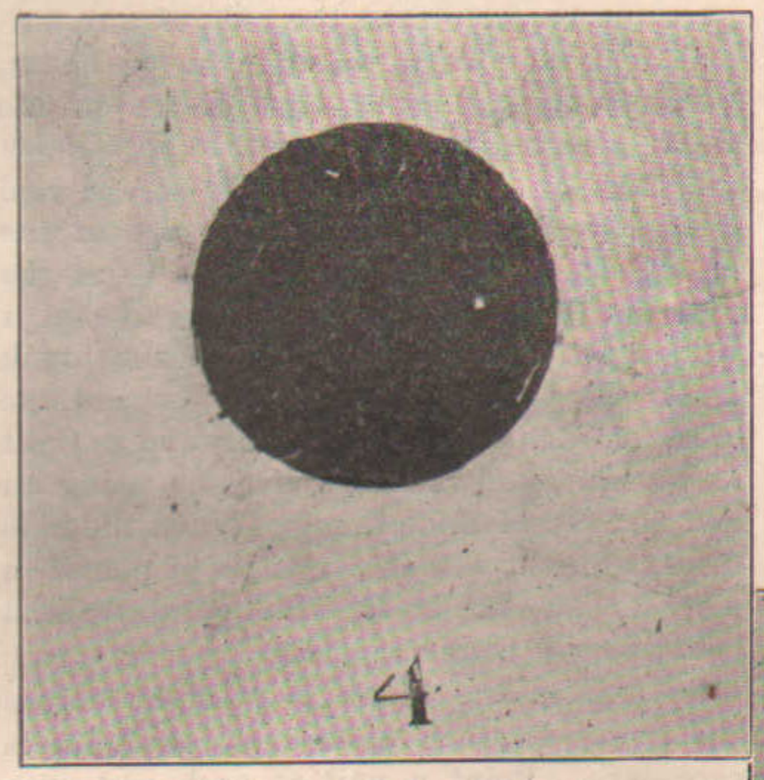
First—Take the spotter out of the old hole and put it into the new one.

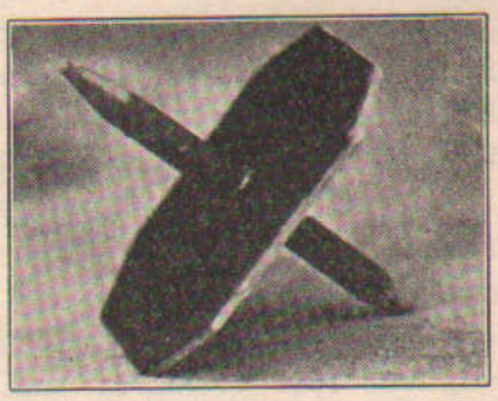
Second—Signal the value of the shot.

Third—Paste up the old hole.

Where boys are employed as markers, it is good policy, particularly during competitions, to have an experienced member of the club supervise the pit work. Boys are more or less irresponsible and unless they are trained in the work and fully impressed with the idea that thoughtless or incorrect marking is an act of unfairness they are apt to slight their task.

Especially in shooting at the shorter ranges, two hundred and three hundred yards, it is a good plan to use spotters that are black on one side and red on the other. When a shot lands in the black the red side of the spotter should be shown toward the firing line. When white spotters hover in the black they have a tendency to narrow the aiming area and frequently make it impossible to center the aim properly. The red spotter avoids this difficulty and its use results in better scoring and greater satisfaction.





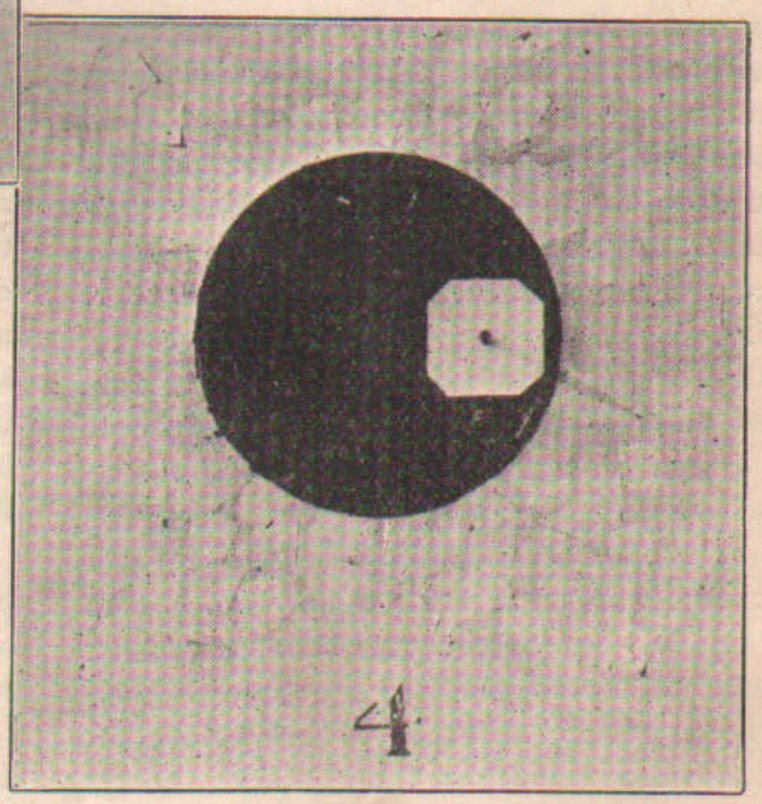
Above—The red marker, by reason of its less violent contrast, leaves to the bull's-eye its full and round appearance and thus offers no temptation to hold off center. Below (left)—Marker made of card board and a butcher's pointed meat skewer. The card board is red on one side and white on the other and the skewer is slotted at its center, to hold the marker securely in place. (Right)—The disadvantage of using a white marker is shown in this illustration. The violent contrast between the white of the marker and the black of the bull's-eye has a tendency to make the bull's-eye look smaller. In the case shown the marksman is apt to center his aim toward one side

If you make the spotters yourself, punch a ⅛-inch hole through their center. Then get your butcher to give you a handful of meat skivers or skewers; each of them, when cut in two, will make two wooden spotter pins which should be pointed at both ends. Or, go to the hardware store and get some ¼-inch dowel pins—a dime's worth will last several weeks—and cut them to the required length, about two inches.

Now take a hacksaw frame and fit into it two hacksaw blades side by side and saw a shallow groove around the center portion of the wooden pin. When the peg thus prepared is pushed through the ⅛-inch hole in the spotter the groove will hold the pasteboard securely so that it will not slide off. When a spotter has a shot hole in it, throw it away or at least paste up the hole. Quite often a firer will draw the red flag for a miss when in reality his shot went through the spotter very close to the previous hole, where it remains unseen and consequently unsignaled.

The Tricks of Trigger Pulls

IF you have ever tried to fix the pull of your Springfield trigger—assuming that it needed fixing in the first place—you will know that it is a job to be approached in prayerful attitude, not only with an oil stone but also with patience and forbearance. After you have taken things apart and put them together for the nineteenth time, there she is: soft and downy like a feather pillow, slick as soap on the take-up, with a final let-off that—well, you know what I mean—just right!



Now, if at this juncture you assemble the job and put it away for the big match

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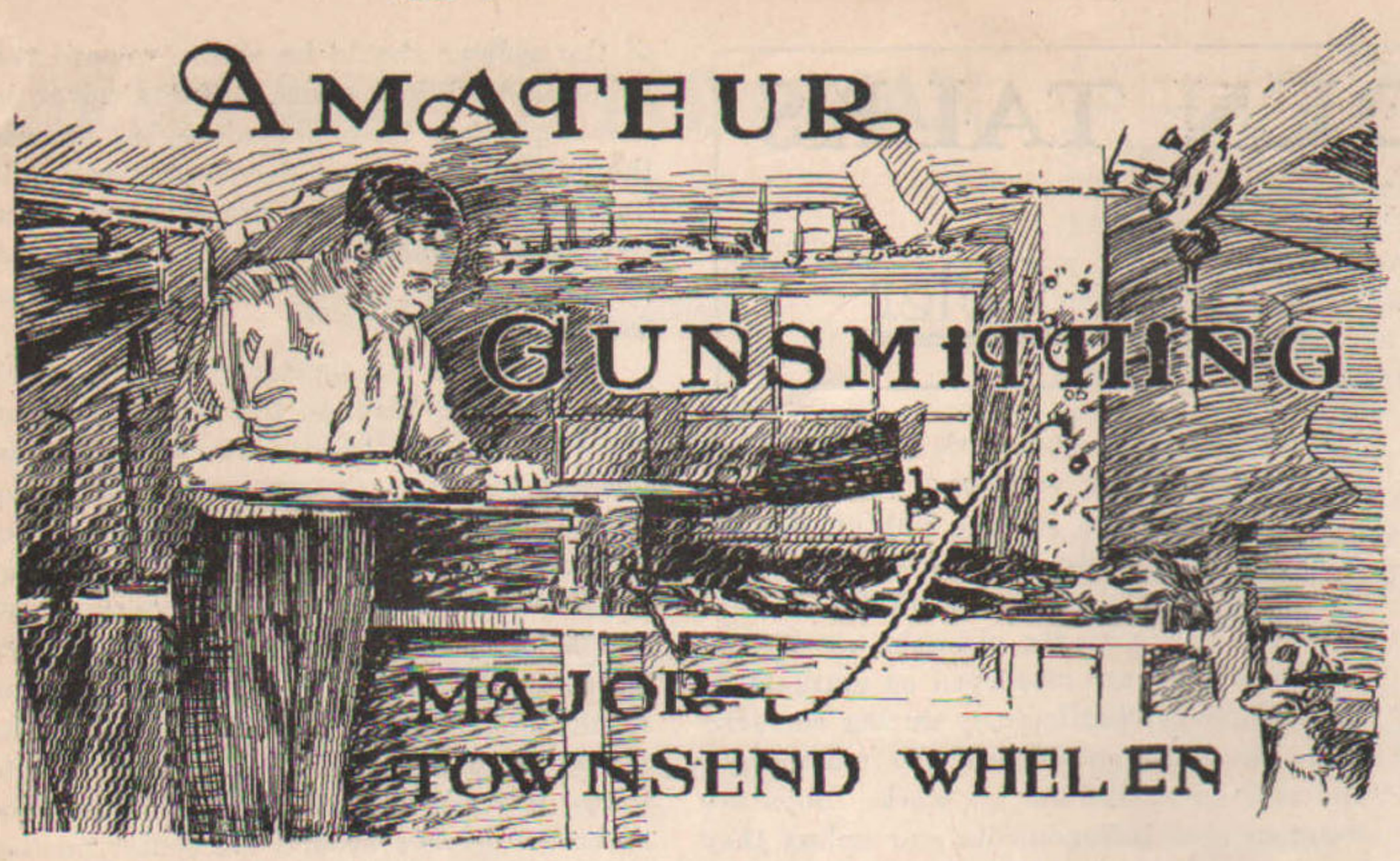


CHAPTER IX

Field Repairs

IN THE field, the repairs that can be made to firearms are naturally limited by the tools available, and by the ingenuity of the sportsman in applying the resources at hand. On a hunting trip there are certain things that everyone should carry. These include of course the outfit for the proper care of the weapons, such as cleaning rod, brass brush, oil, grease, and flannel patches. The Government supplies for the Springfield rifle a small pocket screwdriver. This is strong and very light, and one should always be carried. In addition, every hunting outfit except the very lightest should include a file, a small tool handle containing awls, gimlet, etc., a coil of copper wire, and a small box containing assorted nails, tacks, and rivets. Of course every outfit has a knife, axe or handaxe, and whetstone. Such an outfit need not weigh more than a few ounces, and can be wrapped up in a wiping rag. With it, and a little Yankee ingenuity, it is wonderful what a man can do in the way of extemporized repairs.

One of the most serious, and at the same time most frequent accidents that can occur to a gun on a hunting trip is to have the stock break at the grip. Ordinarily one would think that the weapon was completely out of commission until a new stock could be made, but cheer up because such a break can be repaired in a couple of hours to be as strong as ever. Our Western pioneers were breaking their stocks in this manner all the time, and as it was impossible for them to exist hundreds of miles from any supplies without a rifle, they quickly evolved a method of repair using rawhide. In fact, most of these mountain rifles had rawhide sewed and laced over the small of the stock to strengthen this part, and thus to a certain extent to forestall such an accident. Rawhide, made from the skin of any large animal, shrinks greatly as it dries, and becomes as strong as iron.

If the stock has broken with a long, diagonal break, it can be simply wrapped and laced with rawhide, and when the hide dries it will be as strong as ever. To prepare the rawhide take the hide of any animal, soak it in warm water for a few hours, perhaps adding some wood ashes to the water, and the hair will begin to slip. With the back of the hunting knife scrape and grain off the hair. From the edge of the hide cut thin thongs for lacings. Cut the hide to the correct shape and size so that it will wrap several times around the break and extend about four inches beyond the break on each side. Wrap it around as tight as possible, and then sew it tight, using an awl and the rawhide thong. When the hide dries, which it will do overnight if placed in a dry place, the stock will be tightly and permanently bound together.

Sometimes the break is straight across the grip. In such a case a dowel pin is necessary. Point a nail at each end with the file, drill holes accurately opposite each other in the two pieces of stock, drive the nail into one of these holes, half way, and then drive the other piece of the stock on to the other end of the nail, so that the break meets accurately. Then wrap with rawhide.

One of my friends had his sporting Springfield rifle break at the grip on a hunting trip in Minnesota. Not having any rawhide, he inserted dowel pins made of ten penny nails. Then he took two table knives from the cooking outfit, removed the handles, and filed off the guards, and proceeded to inlay these on either side of the break, so as to extend past the break. Small channels were cut for them in the stock with a knife. Then the whole was very tightly and heavily wrapped with fishline, and was found to be as strong as ever.

Once I had the privilege of seeing a rifle belonging to an old African hunter. A fall had broken and splintered the forearm, but it had been very neatly repaired by putting the forearm back and pulling over it, as one would pull a stocking over a leg, the hide from the leg of an impalla. The hide had been skinned off of the leg without slitting it, and the hair left on. The fine, short haired, and fawn color skin looked very attractive over the forearm and barrel.

Another friend, Mr. Charles Sheldon, when hunting bear on Montague Island, off the coast of Alaska, had a most remarkable experience. He was climbing high up on one of the mountains on which he had seen a bear, and was just coming around a clump of bushes on a steep slope, when he ran smack bang into a big bear coming hell bent for election in the opposite direction. The impact knocked Mr. Sheldon about twenty feet down the mountain side, and his rifle fell about fifty feet. When he picked the rifle up he found that the front sight had been knocked off of it. That night by the light of the camp fire he whittled out a new sight from a silver dollar, and the next day, after a few sighting shots, his rifle was as good as ever. I think that he got even with the bear by killing it a few days later.

We have learned so much in the last few years about the heat treatment and manufacture of steel that it is extremely unlikely that any part of the mechanism of a modern arm will break. The old leaf springs have been largely replaced by coil springs which not only do not break, but do not lose their strength nearly as quickly as the leaf springs. About the only part of the mechanism that is at all likely to become unserviceable is the firing pin or striker. Sometimes these can be filed up out of a large nail, but it is far better to provide for such an emergency in advance, and get an extra firing pin, drill a recess in the stock under the butt-plate into which it will fit, place it in this recess, and then pour melted beeswax in on top. The pin will always be there, and all one needs is his pocket screwdriver to get at it by removing the butt-plate. An extra front sight, leaf for the rear sight, and a broken shell extractor should similarly be fitted into the stock. On the best English rifles there is usually a cavity in the end of the pistol grip containing extra striker and front sight, access thereto being through a little trap in the pistol grip cap. I do not like this scheme because the cavity weakens the stock at its weakest part. Better put them under the butt-plate. On lever action rifles it might be well to include an extractor as well.

The only time when my own rifle was placed hors-de-combat in the field was on one rainy day when hunting deer in the Santa Lucia Mountains in California. I fell on a slippery hillside and jammed the muzzle of the rifle deep into the mud, filling the bore with about eight inches of black

(*Concluded on page* 25)

A New Formula for Estimation of Windage with the Springfield

By COL. JOHN CASWELL

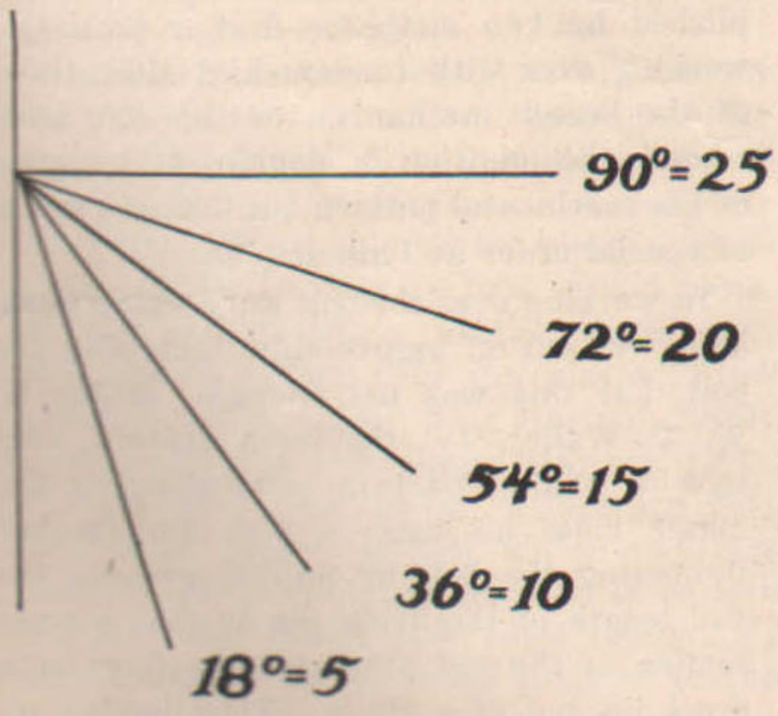
THE lateral deviation caused by a ten-mile wind from either nine or three o'clock may be readily used as a basis for calculation, first, because the mind more readily grasps the full significance of the amount of deviation at right angles to the plane of fire if the wind also is at right angles to the plane, and secondly, because from the result so obtained it is easier to compute the allowances for the various sub angles and vertical allowances.

The fundamental rule in wind allowance is to play to windward of the absolute correction, for then a stronger puff will not put the shot out of the black down wind while the normal wind is more liable to remain steady with occasional increases.

The first step is to compute the force of the wind—and on most ranges flags are provided to show not only the direction but the force of the wind.

Now the limitations of the flag movement are from 0 at the staff to 90° at the horizontal and the stiffer the wind the stiffer the flag will blow out.

So we may consider that for all practical purposes the quadrant formed by the staff and the flag at the horizontal constitute our force gauge, and we will find that under normal conditions a wind of twenty-five miles per hour will straighten out the flag of normal length, i. e., the fly is three times the hoist and the material of bunting to the horizontal, so that if we divide our arc of 90° by 5, we will obtain the various positions in five-mile graduations and will get 18° for a five-mile wind, 36° for a ten-mile, 54° for a fifteen-mile, 72° for a twenty-mile and 90° for twenty-five.



Now having determined the amount of wind at right angles to the plane of fire, it is necessary to calculate the amount of deviation caused by such wind on the Springfield cartridge fired from the regulation rifle. With the conditions as above and the Service bullet we find the deviation is as follows:

At 100 yards.....	1.20	At 500 yards.....	22.20
At 200 yards.....	2.90	At 600 yards.....	33.60
At 300 yards.....	7.40	At 800 yards.....	64.00
At 400 yards.....	13.92	At 1000 yards.....	106.80

for a ten-mile wind blowing from either nine or three o'clock.

Now a man's personal error of hold may roughly be taken as one inch for each 100 yards of range and so we find that if we square the range in hundred yards we will approximate the necessary allowance needed for the ten-mile wind for we will have the following table which is easily calculated mentally:

Range	Allowance	Error in Calculation	Personal Error
100	1	0″	1″
200	4	Plus 1.1	2″
300	9	Plus 1.6	3″
400	16	Plus 2.08	4″
500	25	Plus 2.80	5″
600	36	Plus 2.40	6″
800	64	0	8″
1000	100	Minus 6.	10″

So that our rough estimation of allowance is about 50% nearer than the personal error and is as likely to be correct as the table.

Now we find that in translating this deviation in inches to correction in points of wind on the Service sight we will divide the amount of deviation at the given range by the equivalent of one point correction on the wind scale at that range and that one point of wind on the rear sight is equal to four inches multiplied by the range in hundred yards, so that if the formula $\frac{(R.\ )}{(100)}\ 4$ is used, we will have the correction in inches obtained by one point allowance.

Now, if we take the deviation of the bullet caused by a ten-mile wind as $\frac{(R.\ )}{(100)}\ 2$ and divide it by the allowance for one point at that range, we will obtain the necessary allowance in points of wind on our rear sight for the given range with the wind at ten miles per hour from nine or three o'clock, or $\frac{(R.\ )}{(100)} 2 \div \frac{R}{100} \times 4 =$ pts. necessary to correct, but inasmuch as we have similar factors of $\frac{R}{100}$, both in the divisor the quotient we may eliminate and cancel these two and we will get $\frac{R}{100} \div 4$ or points of wind allowance, and so may deduce the rule of wind as follows: "Divide the range in hundreds of yards by the correction given by one point of wind on the scale for 100 yards and we will obtain the correct wind allowance for a ten-mile wind at right angles to the plane of fire at nine or three or three o'clock."

R in hundreds ÷ 4 = allowance, and for a one-mile wind we may simply move the decimal and for the intermediate velocities of wind multiply by the miles per hour. With the 180-grain bullet we will only require 80% of the allowance at ranges over 500 yards and with the 180-grain, true boattail only 66 2-3 of the amount.

When we come to the winds from other directions than nine or three o'clock, we find that we must make a reduction in the estimated allowance and it will work out as nearly as can be used that the reduction for a wind at ten o'clock should be 23% and for one at eleven o'clock, 40%. This holds true of the reverse at four and five o'clock, except that a vertical allowance should be made for the head on or following wind in proportion of about 10% of the reduction from the nine and three o'clock wind which should be added or subtracted to the elevation.

This method of wind calculation will, I think, be found to work out correctly for all practical uses.

A Remedy for Hard Extraction

By LIEUT. A. M. SILER

THIS article is written for the benefit of those industrious individuals who, when their pettest Springfield has developed or arrived with a bolt that hangs hard just as the extraction of the cartridge case commences, have immediately cussed all head-space guages, fitted a new bolt, and with a sigh, settled down to "dope" one more trigger pull.

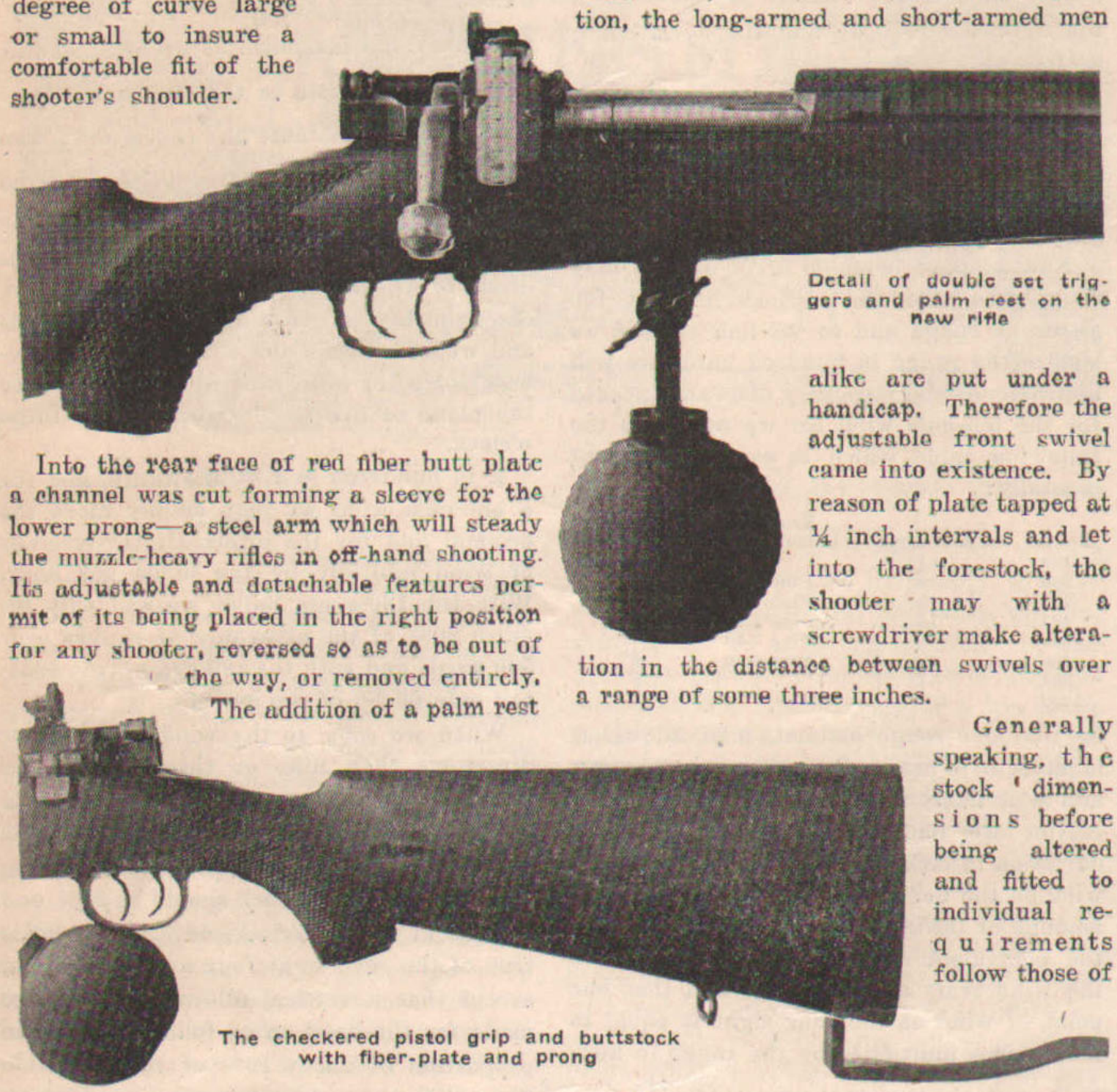
Therefore, just dig out that old bolt, take it into little bits, then carefully inserting only the assembled firing pin and cocking piece (no main spring or striker), lift up hard on the back end of the firing pin and pull it slowly to the rear. The chances are that you will, as I did, find that the curved recess in the bottom of the cylindrical piece that carries the "safety" grip protrudes a bit too far, and just as the slot in the firing pin reaches it, will engage said slot a trifle; not enough to stop the rearward motion of the bolt, but enough to simulate a sticking cartridge case quite successfully. The illusion is the more perfect, since this lower edge and the slot will take hold of each other just as the extraction commences.

Remedy: Take a rather rough and fast-cutting oil or emery slip (the surfaces are case-hardened, and a file will not work), and carefully cut down the sharp edges of the transverse rib on the firing pin, so that its cross-section will be rounded instead of square. Next, pry a small thin screw-driver under the little plunger in the groove that holds said safety catch in place and remove it straight to the rear. Next, using a rounded emery stone, cut down slightly and round off the sharp corner that has been doing the catching. Reinsert the safety catch (and after you have worked over it a half hour, say to yourself: "That certainly did *sound* easy.") Net result: No further trouble.

INTERNATIONAL ARMAMENT

(*Continued from page* 3)

The fiber butt plate provided a comfortable and non-slip finish to the stock which may be fashioned with a rasp to give any degree of curve large or small to insure a comfortable fit of the shooter's shoulder.

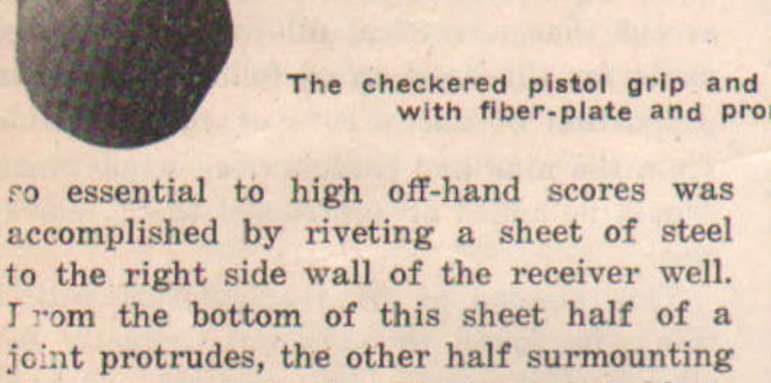


Detail of double set triggers and palm rest on the new rifle

Into the rear face of red fiber butt plate a channel was cut forming a sleeve for the lower prong—a steel arm which will steady the muzzle-heavy rifles in off-hand shooting. Its adjustable and detachable features permit of its being placed in the right position for any shooter, reversed so as to be out of the way, or removed entirely.

The addition of a palm rest so essential to high off-hand scores was accomplished by riveting a sheet of steel to the right side wall of the receiver well. From the bottom of this sheet half of a joint protrudes, the other half surmounting the palm rest shank. The joint is held together by a wing nut which permits adjustment of the palm rest in either direction from the vertical. The palm rest shank is threaded and fitted with a knurled nut by which adjustment as to length is accomplished. The knob of the rest is a large cork ball quite different and providing a far better grip than the conventional Scheutzen "door knob."

The checkered pistol grip and buttstock with fiber-plate and prong



The front sight hood and types of sight provided therefor

The adjustable front swivel is an essentially American refinement never before placed on a match rifle. Position being nine-tenths of hold and hold being about 90 percent of the international game, those designing the rifle realized that the position of the left hand, when the sling is used, plays no small part in correct, comfortable and rock-bound posture. And when front sling swivels, against which the left hand must brace, are all in the same relative position, the long-armed and short-armed men alike are put under a handicap. Therefore the adjustable front swivel came into existence. By reason of plate tapped at ¼ inch intervals and let into the forestock, the shooter may with a screwdriver make alteration in the distance between swivels over a range of some three inches.

The adjustable front sling swivel, an original innovation

Generally speaking, the stock dimensions before being altered and fitted to individual requirements follow those of the heavy-barreled Model of 1922—length over all 31½ inches and from center of butt plate to trigger 13½ inches; drop at comb, 1⅞ inches and at heel 2¼ inches with the high comb carried straight back to heel.

The next question taken up was sighting equipment, and as the regular rear sight, the Lyman N. R. A. No. 48B, could not in the opinion of the designers be improved upon with any other available sight, it was adopted. The front sight, however, presents a very different appearance from the service blade. A hood, mounted on a rectangular base permits the installation of three types of sight. The first is a thick blade of the Marine Corps Service sight; the other two are aperatures. One of these aperatures is a circle mounted on a post; the other is formed by four posts protruding from the sides of a circular reticule and extending only far enough toward the center to form a central peep. Both of the aperatures are carefully calculated to subtend the bull's-eye of the international target.

The proper barreling, stocking and sighting of the rifle disposed of the problem of accurately sending the bullet on its way after it took the rifling, but there still remained the problem of detonating the cartridge in such manner that the bullet would not be hampered in the initial stage of its flight—and that problem involved the question of lock time.

The relatively heavy firing pin of the Springfield bolt action is noticeably slower than the snappy Martini type action, the trained riflemen having no difficulty in sensing the interval—brief though it may be between the release of the trigger seat in the bolt action and the explosion of the cartridge—an interval long enough to permit of the derangement of sight alignment. To reduce this interval to the minimum meant increasing in ratio the accuracy qualities of the team rifles.

The speeding up of the lock time in the international match weapons was accomplished by two methods—first a thorough working over with fundamental alterations of the breech mechanism of the rifle and, second, the addition of double set triggers of the continental pattern but manufactured at special order at Philadelphia.

In working over the bolt the cocking piece knob was cut off appreciably lightening the bolt, but this was not enough. Major L. W. T. Waller, Jr., the team captain, who took a leading part in reconstructing the match rifles hit upon a plan for further lightening the bolt by milling grooves the full length of the firing pin so that a cross section of the rod presented the form of a cross instead of a circle. Then having removed all superfluous weight compatible with strength and safety, the Major replaced the standard main spring with a slightly longer coil carefully calculated to give the maximum speed to the travel of the firing pin without risking punctured primers.

MATCHES AT WAKEFIELD

(*Continued from page* 5)

The two big team matches of the meeting—the Hayden "All America" and the New England Interstate Match—were scheduled for August 17, but failure to record a number of entries to meet the prescribed conditions of the event made the holding of the Interstate impossible and so this number was dropped.

Nine teams entered the Hayden, and Major Dooley so arranged his firing line as to dispose of the first four stages at the short and mid ranges during the morning.

The offhand stage in the early morning was accompanied by a 10-mile wind from 2 o'clock, which was just variable enough to cause the man who got off at the wrong moment to pull a 3, but the light was good and the Coast artillerymen at this point took the lead, with a total of 434 for their 10 shooting members, with the second and third Marines in second and third places on totals of 433, and the first Marines considerably down the line, with 417 points.

This standing started a race between the Coast Artillerymen and the Leathernecks, which made the match an interesting one from offhand start to long-range finish.

During the remainder of the morning, through the 200- and 300-yard rapid-fire, and the 600-yard stages, the conditions varied. The rapid-fire stages were accompanied by good light and not sufficient wind to cause trouble, but at 600 the riflemen experienced a wind which varied from 1 to 3 o'clock and which demanded care if the bullets were to be kept within the black.

At the end of the 200-yard rapid-fire, the Coast Artillery held its lead, with the third Marines in second place, the second Marines in third place, and the first Marines in Fourth place. The totals of the 300-yard rapid-fire brought a slight change to the lineup, the third Marines forging into first place on 1,435 points over the first Artillerymen with 1,423, with the second Marines in third place on 1,415, and the first marines fourth on 1,412.

At 600 yards the Coast Artillerymen, by scoring 6 points more than the second Marines, forged back into first place, and at this point the first Marines who had been following along in fourth place showed signs of life, edging up into second place, so that the morning's shooting closed with this line-up in the four top places: First Coast Artillery, 1,890; first Marines, 1,889; second Marines, 1,886; third Marines, 1,885.

With only four points separating first and third places, it was plain that this match, like so many others, was to be won on the long range, and more uncertainly was added to the probable outcome of the competition when the pairs reported to the 1,000-yard line in the afternoon.

The first three pairs up at 1,000 yards lost points on both elevation and windage, due largely to a variation of air currents. The later pairs found better wind conditions but a failing light.

The long range proved alike the undoing of the first Artillerymen and the salvation of the first Marines. At this stage the Leathernecks put on a 15-point margin over the C. A. C., and the second Marines managed to pile up a margin of 10 points, which dropped the team which had been consistently leading up to this point back into third place. The match finished with these teams heading the list: First Marines, 2,809; second Marines, 2,796, and Coast Artillery, 2,795.

The Ratigan, Campbell and Cummings Matches occupied the forenoon of August 18, with the afternoon devoted to the Marine Corps Long Range Match, a two-man team event at 600 and 1,000 yards.

The early part of the morning was chill, quiet and foggy, with the light none too good. But the firing being done at the shorter ranges in all of the forenoon matches, the scores were good.

The Ratigan Match—2 sighters and 10 shots offhand at 200 yards—drew 95 entries and went to Sergeant J. C. Spraker, one of the old timers of the Massachusetts Guard, on a score of 48, with Sergeant A. F. Frederick of the Marines second and Corporal E. L. Stephenson, also of the Leathernecks, third, each with a total of 47.

When the 90 entrants in the Campbell Match—2 sighters and 10 shots at 300 yards prone—arrived on the firing line there were among them several aspirants to a score which would break the phenominal record set last year in this event of 133 consecutive bull's-eyes. There was ample reason to believe that an ultra long run would be made, for among the shooters was not only Sergeant T. J. Jones, the holder of the record, but also G. L. Cutting, the Massachusetts civilian who pushed Jones so hard in the making of the record—Cutting having totaled 100 straight—as well as other long-run artists, including Sergeant Adkins of the Marines, whose work at Perry last year with his "glass eye" hung up several records for the boys this year to shoot at.

But the conditions were entirely unpropitious for a repetition of last year's sensation, and the large gallery which gathered in anticipation was doomed to disappointment. The dull, quiet, foggy chill of the early morning gave way about 10:30 to sunshine, and a light breeze just strong enough to blow out 4's.

G. L. Cutting started out well with a possible and continuing to shoot ran up 23 additional bull's-eyes, while Sergeant Stake and Sergeant Doyle of the Marines each put over a perfect score and added 38 additional. Sergeant Adkins was able only to register a possible and 3, while Jones, the holder of the record, pulled a 4 on his sixth shot and went out of the running. When the shooting was finished nobody had passed or equalled the record of Stake and Doyle, and these two, tied for first place, decided to arbitrate by means of a coin. The toss gave the match to Stake.

In the Cummings Match—10 shots at 500 yards rapid-fire prone—the first few relays shot in a poor light and zero wind. Later the light improved but a wind veering from 6 to 8 o'clock—one of the worst currents encountered on the Wakefield range—drove down from the rear and spilled many points for the competitors.

The veering rear wind which marred the Cummings Match very seriously disturbed the dope in the 600-yard stage of the Marine Corps Long Range Match, for the wind effected the bullets before the shooter had evidence that the veering had taken place.

Even a more difficult condition was encountered on the 1,000-yard range. Among the first pairs on the right, windage between Target 1 and Target 6 varied from 1½ points on Target 1 to only ½ point on Target 6, with a similar condition holding on the extreme right of the firing line. During this stage the contestants were treated to an exhibition of Wakefield at its worst. The mirage was so light that indications could not be read even with the heaviest of the scopes. But Captain Ashurst and First Sergeant N. Tillman of the Marines, who had come to the long range only 2 down, managed to score 95 and win the event on a total of 193.

For Saturday, August 19, there appeared in the program under the heading of the Beach Match, which aforetime was a conventional test of marksmanship, "Snipers' Match—10 shots at 200 yards"—and no more.

This paucity of information aroused considerable curiosity which, be it known, was not gratified, inquirers being informed that the few fixed conditions which would attend the shooting of the match would be revealed only on the firing line.

Under these conditions not more than half the usual number of entrants signed up the night before the match, but when the morning of the event came, and the shooters saw the special paraphernalia which Major John M. Portal and his carpenters had prepared, a large gallery gathered to watch the shooting. Be it said at this point that as the shooting of the match progressed the gallery caught the contagion and many shooters hurried to the Statistical office to make post entries; also that the Snipers' Match proved a huge success and held a big gallery for more than three hours while it was in progress.

For the Sniper Match, across the top of the 200 yard butts had been built in rude semblance, a stretch of cover such as might conceal an enemy sniper. There were three groups of such cover, each consisting, from left to right, of some trees, a house, end on, more trees, a strip of ruined wall, trees and a pole, the last named object serving to mark the end of one sector and the beginning of the next. Each sector covered 5 target spaces, or approximately 40 feet.

Jack Dooley, as Chief of Snipers, gave

the assembled contestants the simple rules of the game, which were that three shooters —one on each sector—would occupy the firing line in every relay. Each man would load at the command, assume any position he desired and fire 10 shots at a prone silhouette exposed for 3-second intervals—twice in 5 different places in the sector—the exposures, however, not being made in rotation. One shot only to be fired on each exposure and the number of hits scored in the pits. The white side of the silhouette was used and when a hit was made the target turned and fell, manipulated by the butt detail.

When a hit was not made the target remained up for the full period of exposure. The riflemen were advised that the points of exposure would be: Trees left of house, window of house, trees between wall and house, over the wall and trees right of wall.

With these instructions the sniping game began, the competitors either kneeling or shooting prone.

In the first relay, Stanfield of the Marines sent home all 10 of his shots and as the match progressed nearly 25 per cent of the entrants got clean scores with equally that many 9's, for the shooters soon learned that keeping both eyes open enabled them to pick up the target in most cases in time to let off a quick, accurate shot—coaching of course not having been permitted. At the close of the regular course of fire, it was seen that 16 of the contestants would have to shoot off for places on the list of nine prizes, but when the A target was suggested the men who had become keen for this type of competition voted to "shoot it out" and so it was agreed—but this time with the O. D. side of the silhouette exposed.

This change of target registered an immediate difference so far as visability and the settling of ties was concerned, all three of the shooters in the second relay having missed the entire first run of the targets.

Captain Barnes of the Coast Artillery, who had come up with a clean score, sent all 10 of his shoot-off bullets for hits, a feat of snap accuracy which was not paralleled by any other shooter and which gave him the match.

Although it requires considerable range space, and for this reason might prove unwieldly for a large field of shooters, the Snipers' Match as put on at Wakefield has quite apparent possibilities, especially for rifle clubs whose matches list from 20 to 40 entrants. Perhaps the greatest recommendation for this match, aside from the fact that it is a most practical form of training, is that it combines two prime essentials of the successful and desirable event—it holds the interest of shooter and audience alike.

In the Wakefield Snipers' Match the white silhouette proved not only too easy but too large—but these and other similar objections can be disposed of by a careful working over of the conditions and some experiments to determine the proper size target.

But even admitting the few deficiencies in the Beach Match, the average degree of skill displayed by the shooters in this event was quite remarkable. The total number of shots which connected with the target during the record run on the white silhouette was 464 out of 600, an individual average something better than 7 hits out of 10. On the O. D. target, with 15 men shooting, 96 out of 150 shots connected, or an average of 64 per cent.

No. 1—The Captain Ratigan Match (200 Yards)

95 Entries—14 Prizes

1. Sergt. J. C. Spraker, 101st Inf..... 48
2. Lieut. P. S. Lowe, CAC..... 47
3. Sergt. A. F. Frederick, USMC..... 47
4. Cpl. S. L. Stephenson, USMC..... 47
5. Capt. H. H. Parsons, CAC..... 47
6. Sergt. James Wertzburger, CAC..... 47
7. CTM C. S. Cateledge, USN..... 47
8. Lieut. Jas. C. Brown, 101st Inf..... 47
9. Sergt. A. O. Coppage, USMC..... 47
10. Sergt. J. W. Adkins, USMC..... 46
11. Capt. W. W. Ashurst, USMC..... 46
12. Pvt. A. G. Cahall, USMC..... 46
13. Sergt. P. J. White, CAC..... 46
14. Sergt. R. J. Doyle, USMC..... 46

No. 2—The Lyman Match (200 Yards Rapid)

Total Entries, 95—Total Prizes, 14

1. Lieut. N. Tillman, USMC.....50-50-50-50-49
2. Sergt. J. R. Weir, USMC.....50-50-50-49
3. Capt. E. H. Stillman, CAC.....50-50-50-49
4. Maj. W. S. Fulton, CAC.....50-50-50-49
5. Pvt. 1st Cl. J. V. Alexander, USMC. 50-50-50-49
6. Lieut. P. E. Conrad, USMC.....50-50-50-48
7. Maj. S. W. Stanley, CAC.....50-50-50-48
8. Sgt. E. J. Doyle, USMC.....50-50-50-48
9. Cpl. L. D. Wilson, USMC.....50-50-50-48
10. Cpl. J. R. Yucker, USMC.....50-50-50-47
11. Lieut. L. L. Lemnitzer, CAC.....50-50-50-47
12. Sergt. Otto Bentz, CAC.....50-50-50-47
13. Sergt. A. O. Coppage, USMC....50-50-50-46
14. Capt. F. S. Swett, CAC.....50-50-50-45

Lieut. Twichell, CAC., and Sergt. Holzhauer, USMC., lost 14th place on draw.

NOTE—Twenty-four additional possibles and better failed to get in the money.

No. 3—The Campbell Match (300 Yards Slow)

90 Entries—13 Prizes

1. Sergt. E. S. Stake,USMC.....50 plus 38
2. Sergt. E. J. Doyle, USMC.....50 plus 38
3. Mr. G. L. Cutting, Civilian.....50 plus 23
4. Cpl. L. D. Wilson, USMC.....50 plus 15
5. Capt. James A. Ryan, CAC.....50 plus 4
6. Sergt. J. W. Adkins, USMC.....50 plus 3
7. Lieut. P. E. Conradt, USMC.....50
8. Pvt. 1st Cl. W. F. Pulver, USMC....49
9. Pvt. 1st Cl. G. D. White, USMC.....49
10. Capt. Jas. T. Loughlin, Mass.....49
11. B. M. W. H. Walmeley, USN.....49
12. Lieut. W. J. Whaling, USMC.....49
13. Lieut. L. L. Lemnitzer, CAC.....49

No. 4—The Phelan Match (300 Yards Rapid)

90 Entries—13 Prizes

1. Sergt. J. R. Weir, USMC.....50-50-50-48
2. Sergt. T. J. Jones, USMC.....50-50-50-47
3. Sergt. Otto Bentz, CAC.....50-50-50-47
4. Pvt. R. O. Coulter, USMC.....50-50-50-47
5. Cpl. J. C. Johnson, USMC.....50-50-50-46
6. Pvt. G. L. Sharp, USMC.....50-50-50-46
7. Pvt. G. D. White, USMC.....50-50-50-45
8. Sergt. E. B. Porter, CAC.....50-50-50-45
9. Sergt. G. H. Needy, USMC.....50-50-50-45
10. Maj. S. W. Stanley, CAC.....50-50-50-45
11. Capt. M. H. Parsons, CAC.....50-50-50-43
12. Cpl. J. R. Tucker, USMC.....50-50-50-42
13. Sergt. E. J. Doyle, USMC.....50-50-50-42

Fourteen perfect scores or better not good enough to get in the money.

No. 6—The McKenzie Match (600 Yards)

105 Entries—15 Prizes

1. Capt. C. A. Chestledon, CAC., USA.....50 plus 5
2. Pvt. G. L. Sharp, USMC.....50 plus 2
3. Sergt. J. C. Stafford, USMC.....50 plus 2
4. Cpl. L. D. Wilson, USMC.....50
5. Lieut. L. L. Lemnitzer, CAC.....50
6. Capt. J. T. Campbell, CAC.....50
7. Capt. G. del Carrington, CAC.....50
8. Capt. J. T. Lawless, Mass.....49
9. Capt. A. B. Hale, USMC.....49
10. W. T. Abbott Lynn, R. & R. Club....49
11. Cpl. S. L. Stephenson, USMC.....49
12. Sergt. E. J. Doyle, USMC.....49
13. Capt. C. D. Berg, Mass.....49
14. Lieut. A. A. Gladden, USMC.....49
15. Lieut. L. A. White, CAC.....49

NOTE—Nine additional scores of 49 not good enough to reach the money.

No. 7—The Lynch Match (1,000 Yards)

100 Entries—15 Prizes

1. Sergt. M. P. Campbell, Mass..... 49
2. Pvt. A. G. Cahall, USMC..... 49
3. Sergt. E. J. Doyle, USMC..... 48
4. Lieut. G. W. Twichell, CAC..... 48
5. Sergt. E. F. Holzhauer, USMC..... 48
6. Capt. J. A. Ryan, CAC..... 48
7. Lieut. H. I. Berden, CAC..... 48
8. Cpl. G. R. Lee, USMC..... 47
9. PFC. J. V. Alexander, USMC..... 47
10. Sergt. T. J. Jones, USMC..... 47
11. Capt. A. C. Cheslodon, CAC..... 47
12. Lieut. P. E. Conradt, USMC..... 47
13. Sergt. J. C. Stafford, USMC..... 46
14. Cpl. J. R. Tucker, USMC..... 46
15. Pvt. R. O. Coulter, USMC..... 46

The Hayden All-America Match (Team)

Nine Entries

	200	200R	300R	600	1000	Agg.
Marine No. 1.....	417	497	498	477	920	2809
Marine No. 2.....	433	491	491	471	910	2796
C. A. C. No. 1.....	434	497	492	467	905	2795
Marine No. 3.....	433	494	498	460	870	2755
C. A. C. No. 3.....	414	496	487	465	887	2749
C. A. C. No. 2.....	407	494	491	462	884	2748
Massachusetts No. 1..	412	464	453	458	878	2665
Navy Sub Base.....	399	464	469	447	769	2548
Massachusetts No. 2..	374	399	436	394	738	2341

The Marine Corps Long Range Match (Two-Man Teams, 600 and 1,000 Yards)

45 Entries—1 Prize

	600 yds.	1,000 yds.	Agg.
Capt. W. W. Ashurst and 1st Sergt. N. Tillman, USMC.	98	95	193

No. 8—The Beach Match (Ind. Snipers)

60 Entries—9 Prizes

1. Capt. H. C. Barnes, Jr., CAC.....10 plus 10
2. Capt. W. W. Ashurst, USMC.....10 plus 9
3. Sergt. C. C. Stanfield, USMC.....10 plus 9
4. Sergt. C. A. Lonkey, USMC.....10 plus 8
5. Sergt. G. R. Ping, CAC.....10 plus 8
6. Lieut. A. A. Gladden, USMC.....10 plus 8
7. Pvt. 1st Cl. B. J. Nelson, USMC.....10 plus 7
8. Sergt. A. O. Coppage, USMC.....10 plus 7
9. Capt. E. W. King, CAC.....10 plus 6

Six additional perfect scores or better not in the money.

The Esterbrook Match (Individual Pistol)

	Slow	Rapid	Quick	Agg.
Capt. R. E. Vermette, 5th Inf., USA.....	81	92	85	258

NEXT SCORES

Sergt. Hoge, USMC.....	75	87	93	255
Major Frazer, CAC.....	76	90	88	254
Gy. Sgt. Thomas, USMC.....	77	87	90	254

Visible Bullets

By A. K. FRIEDRICH

DR MANN in his book "The Bullets Flight from Powder to Target," states that it is possible to see bullets in their flight under favorable conditions. This statement is usually received with a great deal of skepticism.

About two weeks ago I was shooting my .32-40 at 200 yards and E. M. Ward was spotting for me. We had a high power spotting 'scope; one powerful enough to see .22 calibre bullet holes at 200 yards. After a while he turned around and said: "I can see the bullets." L. H. Bean, who was present, laughed at him. So Ward told him to look and he too saw the bullets. I tried it next. I missed the first one, but I saw the next two distinctly. They not only curved downward, but they also had a drift to the right. I was shooting factory ammunition with a published velocity of 1,450 feet per second, though it was probably about 100 feet higher in my tight chambered Niedner.

HUNTING IN ATHABASCA

(*Continued from page* 7)

waited until he reached a position where I could drop him without fear of spoiling the head. The 180 gr. Lubaloy out of my Springfield stretched him out with a jerk, but I found to my great disgust that both horns had been broken. The old boy was evidently a scrapper. I took the sinew to repair my shoe packs with and some of the best meat for soup. The next day, hunting from Sheep camp, I saw 19 sheep early in the day and had to climb a high hill to get above them. Not seeing any good heads, I made up my mind to get a young ram for meat, but while on the last part of my stalk, happened to look over the ridge I was following and saw something moving in the valley beyond. The glasses disclosed a grizzly and I immediately went after him. A nice shoulder shot at a little over two hundred yards sent him rolling down the hill. Being alone and unable to tell just what harm I had done, I fired again as he presented his hindquarters, breaking the right hip. He settled in the creek. When within fifteen yards, I saw some slight movement of the head and, being alone, thought it prudent to shoot once more. A second shoulder shot removed all my doubts and I proceeded to push the animal out of the water and on to the bank. No easy task, as he must have weighed all of six hundred pounds. None of the bullets had gone through; the chest cavity was destroyed and one shoulder and one thigh badly smashed.

The camp at the Forks of Sheep Creek offers goat, deer and caribou, but no kill was made. The best hunting is on the north side of the creek. Sheep Creek camp is best for bear, caribou and mountain moose. Here I secured two good bulls out of a mixed herd of nine, and would have had time to get more. Shooting in driving snow at 150 yards or less, one fell at the first shot, while the other required two. The second caribou presented a head-on shot, with some of the herd partly masking the target; my first shot was badly centered, and glanced along the neck, spoiling the scalp. Here a young caribou was killed by Mr. C and quite a number seen, notwithstanding the very bad weather. The camp near the Kwass cabin in the brulé is a good place for moose and caribou.

On the return trip, we did not hunt from the Muskeg River camp, but spent a few days on Teepee Creek in a last effort to get moose. Finally, I picked up a fresh track a couple of yards from a spot where I had rested and lunched and had a good head within the hour. Just after stopping this animal by a lucky shot at some 300 yards (440 paces down and up a ravine) I saw another and better head not far away. In view of the fact that we had experienced great difficulty in seeing moose and were due out, I passed up my chance, and the next day sent the guide and Mr. C after it. The moose was located close to the spot I had indicated and Mr. C wounded him. Thanks to the guide's remarkable tracking ability, Mr. C was given some other chances after a couple of hours of fine work over difficult tracking ground, and the animal was finally killed. The scalp of my moose "slipped" and could not be mounted. The trouble was probably caused by insufficient salting. Some of the prongs on the antlers are broken off and the head showed many scars, indicating that I had closed the career of a truculent individual.

The country all along the Divide from Grizzly Pass to way north of Sheep Creek Pass offers excellent hunting and, although devoid of trails, can be reached by and traversed with a pack train.

There is plenty of deer east of Grande Cache and fool-hen, blue grouse and prairie chicken are found in great numbers all over the country.

Caribou is so easy to hunt that it is a question whether it should be looked upon as game. The goat is not much more difficult, being a very stupid animal, but it ranges over more difficult ground than the caribou. The still hunting of moose is a real sport, as these animals are wily and very wide awake. There is no calling of moose in Alberta because the moose season does not open until after the rutting. Sheep are most difficult to get, not only because of the country they roam in, but because of their alertness. As to grizzly, it is necessary to remember that a wounded grizzly or a female with cubs can be very dangerous; for the rest it is a matter of luck, unless one hunts with dogs. No hard and fast rules can be laid down with regard to any kind of game. Occasionally one gets a dead easy shot at the most artful and then again a good man will be hopelessly outwitted by the usually easiest prey.

To get the best results in the shortest possible time in the country described, it is best for a party of two to arrange for one B. C. and one Alberta guide and carefully time the trip with an eye on the game laws of the two provinces. An Alberta guide is not allowed to guide in B. C. and vice versa. Last year in Alberta sheep and goats could be hunted in September and October; deer, moose and caribou from November 1st to December 14th. In B. C. moose, caribou, goat and sheep from September 1st to November 15th, deer from September 17th to December 15th. Bear in either province any time except July and August. It is necessary to take an Alberta as well as a B. C. license and a special three-bear license for the Reserve.

A NEW SCOPE MOUNT

(*Continued from page* 12)

movable and fixed base surfaces, to bear evenly.

Mr. Noske furnished me with two types of receiver bases, the type just described which carries its elevation device and a base which does not contain any elevation device, the elevation in the latter instance being obtained within the telescope itself. Ordinarily I would incline to the latter method of making adjustments for elevation, but his external elevation system appeared so interesting that I naturally desired to try it out.

There are, of course, several very good reasons why the minimum of adjustments should be employed upon a mounting when one has a most excellent and reliable internal elevation adjustment on the glass, but the question is still an open one and we thought it just as well to try out both systems, internal and external, and see for ourselves. I incline to the internal type of elevation adjustment in the rigid type instrument, mainly for the reason that it is there in the first place, has proven very satisfactory, is easily and always accurately read and makes it possible to design a simple and durable mounting. Further along in this article I will go into some detail regarding internal elevation adjustment when the fine little Hensoldt glass is discussed.

The base to which the Noske elevating drum and plate are attached by the forward heavy pivot screw which is easily seen in the side view of the device, does not show readily but it can be made out if one looks closely at the very rear end of the mounting where it rests against the side of the receiver. This base is a rectangular piece of steel machined to the

Another type of Noske mount

contour of the receiver and drilled so that it may be screwed to the receiver. When I first tried out this mounting I was unable to obtain what I considered really satisfactory results and after eliminating everything possible I finally came to the conclusion that there must be a constant and gradual loosening of the base plate on its fastenings to the receiver. In fact I was convinced from the very start that this error would occur although I was at a loss to see just why, after four heavy strong crews with two special dowels, were employed. Nevertheless, this did occur and I deciled that I would end this error by brazing this base plate to the receiver; this I did and from that time on my troubles ceased. And now comes a very important point and one that is, according to my way of looking at this telescope sight base question, vitally important. It is, that your bracket which is attached to the receiver must be brazed or screwed and hard soldered in place, otherwise you will be in constant trouble with the most annoying errors and inclined to the view that all rigid telescopes and especially the very splendid, large field and brilliantly illuminatel foreign glasses are contraptions of the devil, incapable of any sort of real accuracy.

I have before me ten types of German telescopic rifle sight mountings as issued to their Snipers. This interesting display discloses the very impressive fact that every one of them are very firmly screwed and hard soldered in place so that the likelyhood of shooting loose is just about eliminated for ever. It is quite evident that Heine experienced this vital defect early in the game and solved it. This point of the mountings working loose has always given the rigidly mounted telescopic sight a black eye and with very good reason, but in this instance our models were always the sport-

ing types and the Germans were not impressed with the necessity for such care, no doubt assuming and very rightly that four-legged game can not be compared with the two-legged variety and that accuracy in the game field is fair enough if only approximate.

Before taking up the question of position of the glass upon the rifle I will digress a bit and discuss some of the reasons for the rigid type of instrument. In the first place the American system of sliding tube requires that it be at least long enough to allow not less than 6 inches between mounts. These mounts are either all on the barrel, all on the receiver, or the front mounting or bracket on the barrel and the rear mounting or bracket on the receiver. This method of mounting accounts to a certain extent for our rather long tubes and also for the fact that the eye relief of our glasses are very short and therefore the eyepiece must be quite close to the rifleman's eye in order to observe the full field of the instrument. The optical construction followed by our two most well known manufacturers necessitates the employment of a system that will obviate any injury to the shooters face upon recoil and this the sliding tube certainly accomplishes admirably and it also relieves all strain upon the lenses at the moment of recoil. From a target shooter's standpoint, our telescopes are perfectly satisfactory but from a hunting or battlefield standpoint, they leave much to be desired. It is perfectly possible to make these sliding tube instruments with a large, well illuminated field and in any power and length desired by the rifleman, but, and here is the rub, if you shorten up your tube and still insist upon its sliding, you are going to get into trouble immediately from the fact that your eyepiece is violently jammed against your rear mount, and if the eye relief is increased and the tube shortened up sufficiently so the rear mounting or bracket must be upon the receiver bridge and the front mounting or bracket on the receiver ring or threaded hood, you certainly are going to have trouble from the start unless you employ some sort of recuperating or cushioning device which will return the glass to battery as it were. I have seen such devices used but they were dismal failures and really caused more trouble than any other type of mounting, as the poor glass was subjected to a regular punching bag effect and soon the lenses, mountings and rifleman's patience were in shreds.

As you shorten up the tube you are confronted with certain points of construction as it pertains to the rifle's receiver and the best place to attach your bracket or brackets. You are limited to three points: the left side of the receiver, or the top of the threaded hood or receiver ring which is that portion of the receiver holding the barrel, and the receiver bridge. In the last two instances—receiver bridge and threaded hood—the glass is now so short and has such a large eye relief that its sliding feature is a detriment instead of an advantage, for unless the shooter remembers to pull it back to battery it is going to be hurled like a little battering ram violently against its rear mount, the rear mount soon breaking down, not to mention injury to the lenses and the general derangement of the instrument. I have seen this happen many times during experiments and the most massive mounts or brackets soon rendered so much junk. A blow of metal upon metal is exceedingly violent as compared to the blow delivered to a rigidly mounted glass when cushioned against the shoulder. A rigidly mounted glass, no matter how well mounted, when placed in a machine rest will tear itself to pieces in a few shots. There must be that cushioning effect and the shooter's shoulder furnishes that most satisfactorily, indeed.

It will be seen from the following that the gradual shortening of the telescopic tube in order to render the instrument more compact and improve it optically by giving it larger light gathering lenses which in turn increase the field tremendously, have forced us to adopt the rigid type of mounting if we care to consider these splendid instruments with their perfectly superb illumination, great field, splendid eye relief with its attendent freedom against the most violent recoil, and wonderful distinctness of the object to the very edge of the field. These are points that no rifleman is going to readily surrender if he can possibly manage to find a way.

As mentioned earlier in this article, I stated that most of the foreign telescopes were mounted very high upon the rifle and far to the rear. One can understand very well why they are perched so high upon the weapon but it is hard to understand why they are located so far to the rear. In the prone position the glasses of all the German types are so far back as to make any sort of shooting with them simply out of the question. Evidently, Heine shot sitting down or resting his piece on a sandbag or some other sort of rest; he certainly rarely shot it prone.

Most of these German sights are mounted directly over the center of the rifle and the mountings are so made as to allow of a clear view of the iron sights under them, the front bracket having a large opening cut out in its center and the rear mounting slightly offset to the left. I have never seen a true side mounting, that is, one that is attached to the left side of the receiver. I suppose their receiver does not lend itself as readily as does ours to this form of bracket. This German method of using iron sights in an emergency is a good one but it certainly does not give the glass its due as regards a really comfortable and accurate position, that is from the American standpoint at least.

Bearing these points in mind I urged Mr. Noske to offset his bracket so the glass would be directly over the center of the rifle and as low down as possible. This he did very promptly and thoroughly. The position of the glass, as far as closeness to the receiver is concerned, is governed by the diameter of the eye piece or ocular section of the glass and its relation to the bolt handle when in the raised position. This low position is most comfortable and is about the same as when using the iron sights at 500 yards. In fact, the service stock is quite comfortable with this mounting which is more than with any other one I have ever tried.

The eye relief of the glass is 3⅛ inches which is more than ample for the most severe recoil. It is very easy to adjust this telescope so that the shooter is in the most comfortable firing position, especially when prone. The clasps which hold the telescope to its mounting are clamped firmly in place with adjusting screws not soldered in place as is the usual continental practice. One can adjust for position and lock the tube firmly. It would be an improvement to construct the rigid type of telescopic rifle sight tube with a slight taper so that the action of recoil would the more firmly lock it in position for there is a chance that the tube will move forward slightly at each shot usless it is most thoroughly locked or clamped in position. At first I encountered this difficulty but soon overcame it by the use of very thin copper shims which completely reduced the trouble. One thousand eight hundred shots with the heaviest match loads have failed to budge it in the least, but it can be instantly loosened up for movement. This is an undoubted advantage for most clasps are positively attached to the tube and can not be loosened after the manufacturer has once set them. Every one, according to Heine's system, must have a rubber neck or else only short men with short necks and short arms need apply for the specialists job of sniping.

For hunting purposes the bracket is so made that the glass is to the left of the line of sight when using iron sights. This position is not as comfortable or satisfactory from a target standpoint, but it is fairly satisfactory for game work and it allows of the use of any type of receiver or rear barrel sight being used. When your bracket is made to give the glass a central position there is a chance that your Lyman 48 is in the way and you will have to remove it . I believe this can be satisfactorily adjusted, however.

There is a cut showing one of these brackets with its sight attached to the Winchester No. 52 bolt action .22 rifle, but in this instance the iron sight has had to be removed. It would be better to employ the side

bracket offset so the glass were over the center of the weapon and then by removing the instrument the regular iron sight could be used. On the .22 it is not necessary to braze or hard solder the bracket into place as recoil is absent.

I have one of these sights on a Savage .300 bolt action rifle, side mounting with tube on left side of action and it is giving the most perfect results. Iron sights can be used instantly.

The Hensoldt glass used with these Noske mounts is a very fine one. The two that I have are in 2¾X or to all intents and purposes three power. The glass is 8½ inches long, weighs 9½ ounces; has a field of view at 1,000 yards of 135 yards and in optical qualities is simply immense. The two glasses are sharp and intensely brilliant to the very edge of the field; this denotes fine optical work and is not always obtained in some of the very best instruments. The power appears to be ample and I have had no trouble in making just as small groups as with glasses of twice the power. There is a marked and decided advantage in the fact that the pointer or post reticule with which these glasses are equipped does not appear to magnify tremor in the least and this is a good point. There is no trouble in picking up instantly the most indistinct object. Objects thrown in the air are picked up just as quickly as with the best iron sights. These are points that should appeal to the hunter, they certainly were taken into account during the war and made the best of.

I am informed that Hensoldt now makes a 4X glass which is very nearly as compact and quite as brilliant, but to date I have not been able to get one.

There appears to be absolutely no movement of the lenses due to the violent action of recoil. I have come to the conclusion that it has been overcome entirely. One of my Test Sergeants has a most splendid Zeiss 6X glass with a field and illumination that takes ones breath away, but the glass is rather long and clumsy as compared with this little, handy and efficient "Ziel-Diatly;" however, the point I wish to bring out in this instance is that his glass also is rigidly mounted and he has worn out two barrels already and this instrument's lenses are as secure and firm as the day it left its maker's shops. All this points to the fact, I believe, that if the mount is made correctly and the glass can be prevented from hammering, the modern short-tubed telescopic sight is going to stand up satisfactorily, when they are made by reputable manufacturers with experiesce back of them.

I experienced none of the "Will-O-The-Wisp" results with this Noske mounting when taking it off and replacing again; the next shot would go right into the group without fail. It is just as well to remember that this is very likely not to happen if you place your dependence on screws alone. Sooner or later your outfit will shear itself completely off the rifle, as the Ross telescopic outfit would do. If you set up that little taper pin securely you will obtain exactly the same results the next time you use the outfit.

Groups of 2½ inches were made many times at 200 yards with match ammunition, of course, and from the muzzle and elbow rest, 10 shots.

The glasses come without any graduations upon the elevating dial—internal system—and which is mounted on the top of the tube and can be seen between the two clasps (top view), and so one must cut his own graduations after sighting in. I cut rough minutes of angle on mine with a pen knife and after zeroing at 12½ yards set it for 1,000 yards and hit the target for a four the first shot. I would not guarantee to repeat this performance because I fancy that my luck was with me that day, but I do know that this same sight setting remains constant or will get me on the target every time I desire to do so. This is a good deal more than one can say for most of the outfits seen on the rifle range.

The glass also has a special focussing device which is a collar graduated in a similar manner to the usual binocular occular adjustment. This collar can be seen in the photographs and the adjustments also. It is a great convenience and can be positively locked.

There is another point which I wish to lay emphasis upon and which is very important, especially with the rigidly mounted telescopic sight when fitting the bracket to the receiver; it is this: That with some makes of glasses you are in trouble if you have failed to get your bracket plumb in relation to the rifle's bore. If you are off a bit, your elevations are impaired and you may not be able to use the piece below, we will say, 500 yards. Or, you will see a fuzzy halo of the front sight through the glass. This latter condition, however, you can eliminate quickly by attaching your bracket with one screw and then pivoting up and down till this image of the front sight disappears, but in doing this you may have so changed the elevations to render shooting with the glass impossible except at the longest or possibly the shortest ranges. In the Hensoldt and some others, but not the Zeiss unfortunately, there are means of adjusting your pointer so that you can zero for elevation and still have plenty of latitude. This is an immensely valuable feature. Simply loosen up the two little set screws located on the top of the dial and adjust the little circular ring, then clamp the screws again and you are all ready for business. In some of the other splendid types of instruments one is obliged to shim up with metal or file down. This feature I have mentioned is worth a lot. I notice that most German sniping glasses captured on the battle field have this feature well worked out.

There is ample adjustment for elevation in this little 2¾X Hensoldt up to and including 1,200 yards, internal adjustment I refer to, and of course with the exterior elevation furnished in the Noske mount very much longer ranges are possible of attainment, although one has little real use for such long range shooting.

The modern telescopic sight is rapidly becoming a sturdy and reliable instrument. It has been used and is being used by some of the greatest big game shots of our time. Major Powell Cotton, the celebrated African Explorer and big game hunter, used one on a .256 Mannlicher for nearly two years and killed about every sort of game that country affords. His glass was rigidly mounted and he became so impressed with this type of sight that he preferred it to any other system. It never gave the slightest trouble in all that time and stood up under the hardest and most violent treatment. He speaks of its rigid mount stressing that point especially. His glass was made in England and was about three power.

I might remark that the serious defect that some glasses have unless one looks very nearly if not quite through the center of the lens, of apparently causing the cross hairs or picket to move about and which we call paralax, is entirely absent in these little Hensoldt glasses. One can make as good shooting with his eye on the extreme edge of the glass as through the center. There is no movement and the pointer remains fixed and immovable.

I recently did some night shooting with this instrument at an old tree which was on fire in several places, or, rather just glowing here and there where the fire inside the trunk had worked itself through. This tree was at a range of 600 yards and the mark was small, being various small limbs here and there. When a hit was made a great shower of sparks would fly upwards showing that a shot had registered. With a very well and thoroughly known American glass of 5 power it was nearly impossible to pick up the object and hold it, owing to the small field and apparently poor illumination, but with the 3-power glass the object stood out like a sore thumb and nearly every shot threw up showers of sparks. It was the simplest thing in the world to direct one's aim. It impressed me greatly with the possibilities of the telescopic sight when properly constructed and mounted.

There are some sportsmen who consider it quite unsportsmanlike to use a telescope on big game as it is so very easy and the game has no chance, but it has always seemed to me that a clean kill is more to be admired than the chance of a misplaced shot through indistinct vision.

There are several features about the telescopic sight that may be of interest to

the novice and one of them is that you can hold off the object with the most apparent ease and still register on the target. The reason for this is because you see just what you are doing and can do it instantly and accurately. Again when shooting at game if you miss your shot and can pick up the strike it is at once the easiest thing to hold higher and to the left or right and in all probability upon your next shot a hit is recorded. With iron sights your chances are far less indeed to do this.

Many of the British glasses I have examined, in fact, most of their instruments were mounted upon the left side of the weapon. There are several good reasons why this is a very poor practice and amongst others, is the very important fact that the sight on the side of the rifle has a very circumscribed field of view when used from behind cover. I am speaking now from a military standpoint. One of the reasons why this side mount business dies so hard in the military establishment is because there is the belief that rapid fire must be used in sniping and that the rifle should therefore be capable of being charged with a clip. Such reasoning shows nothing short of incredible ignorance.

We can not criticize the British overly much, however, because our own telescopic musket sights of military pattern have always reposed on the left side and in such an uncomfortable position that the left eye was much more easily used than your good old reliable right eye. This position also causes a lateral error which is not to be advised and men are apt to cant their rifles badly. The position taken by the shooter's head is clumsy, exceedingly uncomfortable and in every way not to be thought of if accuracy is the first consideration.

I believe these points are thoroughly understood now and that in the future our telescopic sighted weapons will be the most perfect instruments of precision yet produced.

The little Noske glass and its mounting more nearly approaches the ideal than anything so far attempted and has given promise of considerable merit; it certainly bespeaks for the inventor the greatest praise for producing one of the soundest mountings from a military standpoint ever produced.

REMINISCENCES of a RIFLEMAN

(*Continued from page* 8)

tions. Looking into the blue distance over our head he replied: "Son, we often wonder what makes these rifles climb so badly." That old cuss knew exactly what was the matter and we were pretty sore until one time later we overheard him talking to his pet rifle when he thought no one was about. He called the piece "old girl" and was slapping it first one side then the other with his open hand, saying: "You will throw me a three, will you? Take that, and that." After that we were bound to make some allowances for artistic temperament.

It was William V. DeFolk, of Philadelphia, a noted coach and ever friend of the beginner, that finally said to us one day: "Boys, loosen your front bands; they are too tight." Gosh what a lot of trouble Old Pop could have saved us with even less breath.

Ohio had no trouble whatever in 1901 in taking and retaining last position among the teams entered in the team events, but returned with brave ideas for future advancement.

Perhaps one reason so little attention was given to the rookie from the West this year was that the celebrities were very busy preparing for the fine trimming handed to the international team by a team from Ireland. Reverently we from Ohio watched our idols perform on the long ranges in this international affair, and no one could feel more keenly than we the disappointment as the Irish team continued to widen the lead from range to range.

There was one incident, however, that caused us much surprise and wonderment at the time and which considerably shortened the horns of our super marksmen in our own estimation. Breathlessly we watched each shot fired when lo and behold, after a long and careful aim from the back position one of our most noted shots executed about the worst case of flinch that we have ever beheld from that day to this. As he pulled the trigger the muzzle of his rifle twitched it seemed all of two inches before the report came. Green as we were, we had no doubts in calling his shot a miss at eight hundred yards. In fact, it would have missed a red bank barn at a hundred. Right there the conclusion was born that if an old Creedmore shot could pull a stunt like that there was hope for the rest of us.

Nineteen Hundred and Two found Ohio back again at the Sea Girt shoot, this time with a bit more confidence as well as a larger supply of ammunition. We didn't trust that chap that sold us the "Peyton" brand any more. Three or four of the members were entered in the long range matches and, while no one landed, the showing was encouraging. Corporal Winder, the lanky chap who later was to become a familiar figure wherever riflemen gathered, was entered in the competition for a place on the Palma team that was to compete later in Canada. Winder made this team in the tryout, well up at the head of the list, but was not selected as a member, the reason being given by the deciding authority that he, Winder, "lacked experience in atmospherical conditions." At any rate we from Ohio went back home unnoted and forgotten and the team that was sent to Canada got beautifully licked in their shooting match, though it is said that they did fairly well at the banquet that followed.

The turn of the political wheel found General A. B. Critchfield directing the policies of the Adjustant's General Department in Ohio in 1903 and things began to hum for the Guard of that State as a whole. It is not the purpose here to state in detail the many things that enterprising officer did, but for the guardsman who liked to shoot, Ohio was a very good place in which to soldier. In the rifle training as well as in other matters "Critch" simply took the lid off and threw it away. Backed by such officers as Colonels Bryant, Howard and a few others of lesser rank it was not until about 1913 that any manner of lid for the rifle game in Ohio was resurrected and during this period Ohio developed probably faster than any other State in the Union in rifle shooting.

In the spring of 1903 a National Guard Convention was held in the city of Columbus in which our old friend, General Bird W. Spencer, was in attendance. Gen. Spencer was at this time President of the National Rifle Association and was much interested in getting together a team to go to England for a try at the return of the Palma Trophy, lost the year before in Canada. At the convention Gen. Spencer asked in the course of a few remarks upon the subject, as to how many men Ohio would send to the tryout for the team which was to be held at the Sea Girt range. With characteristic directness, Critch replied: "Ohio will send at least a couple of men, but first I should like to know what manner of men are wanted. Last year we had a shooter who unquestionably had shot his way into a position on a similar team, but that he had been rejected on the ground that he had 'lacked experience in atmospherical conditions,' so now, General, if you will tell us what you want, if it be after dinner speakers we have 'em, but if it is shooters you want, shooters will be sent."

When the laugh had subsided General Spencer dryly remarked that his market was already overstocked with the former gentlemen, and that it was real shooters that he had in mind.

Winder was the first man to bring real prominence to the State as a result of his individual performance at the tryout for the Palma Team mentioned above. He finished in first place in company with the fast Eastern cracks, and returned as a shooting member of the victorious team in England. The knowledge gained by him on this trip was of very great value to the training in the State.

The 1903 so-called National Team match found the Ohio team in fifth position, and its members shooting well up in the individuals. Ohio had arrived. Winder won the Leech and your humble scribe the Wimbledon cups. Other individuals on the team had landed well up, and there was some red fire and much publicity upon the team's arrival home.

Shooting and Fishing (now ARMS AND THE MAN) then as now the official organ

of the N. R. A. in its writeup of the Sea Girt matches, contained a paragraph mentioning Ohio for the first time since the team's participation. It ran something like the following:

"The shooting of the Ohio Team this year was the occasion of considerable surprise. This team shot its way into fifth place over several other supposedly much stronger teams. It is said that the majority of the shooting members of this team are from one company of the guard at Bloomingdale, a small town wherein rifle shooting is a matter of civic pride."

As a matter of fact the short paragraph in itself was correct enough except that the writer thereof then and afterward persisted in misspelling the name of the town. How those Bloomdale boys did cuss that scribe. It was from this village that came the three Fry brothers, Winder, Simon, Smith and Richard, all of whom within the next ten years became at least nationally known in rifle circles. It is a matter of record that none of these men were ever shot off a team; they had to be shelved by orders.

When one looks back to the days herein described, the days when, figuratively speaking, Ohio broke into the game with an ax, and to contemplate the National Matches of 1922, there has indeed been some changes both in arms and ammunition and in geographical attendance as well as in the ethics of the game. In those old days there were no designated instructors at large. True, each team had its coach and officials, but a novice stayed a novice unless he could climb out largely by his own efforts. In those days the service teams, all of them, were mere novices compared to the teams from New York, New Jersey, Massachusetts, Pennsylvania and the District of Columbia.

From 1900 to 1903 the really famous long range shots of the country could be counted very quickly. Many of them have passed out for the final reckoning of the score. Some are still with us and going strong. There was Dr. Scott, Weatherald, Lizear, Bell, Cook, Farrow, Dardinkiller, Hudson, Tom Keller, Tewes, O'Hare, Doyle, Fink, Wilson, Keough, Simonds, Wells, Thurstin, Pope, and some others not now recalled. Casey was a young fellow and "Mother" Casey was a little girl. General Spencer was at that time directing the destinies of the National Rifle Association, with Lieut. Albert S. Jones as Secretary. The latter appears to have dropped out of the game, but the General is still holding the reins at the Sea Girt range with his efficiency unimpaired by the long years of effort in keeping the rifle game going and in making Seagirt perhaps the most popular of all the larger rifle ranges of the country. More power to you, General. May you long continue to extend the hand of fellowship to the gathering of the clan.

MAKING CROSS WIRES

(*Continued from page* 13)

one-quarter inch apart and staggar them about one-sixteenth inch, as shown in the sketch.

Wind the wire in and out around the nails and slowly pull it through the row of nails. Repeat several times until the wire is straight and free from kinks. A little soap is a good lubricant for this operation. The alternate right and left bending will straighten the wire. After thus straightening it, examine it carefully with a magnifier and pick out a part which is particularly smooth and of uniform diameter, and cut it out of the piece. If you desire a square end post, clamp this wire firmly between two metal plates with square ends, so that the wire just barely sticks out beyond the plates, and using a very fine oil stone polish it down until the stone has polished the ends of the two plates thoroughly. Take the wire out and examine it with the magnifier. The end should be perfectly flat and square, with sharp, clean-cut corners. If not just right, place it between the plates again, and repolish the end. The finer the oil stone and the lighter the pressure, the sharper will be the square end on the post. With a little practice a very nice post can be easily made.

A pointed post is rather difficult to make without a speed lathe and a very small chuck. It can, however, be made by hand. To do this, take two small, narrow strips of metal and cut a shallow V groove in each, so that when placed together they will just clamp the wire securely in the groove. The wire is thus held like the lead in a pencil and holder and wire can be rubbed down to a sharp point, just as one would grind down a pencil on a stone. Considerable skill is required to produce a point which is sharp and uniformly round.

Having now made the post, the next step is to place it in the cell. The score for the post should be cut deep enough so that the post is half imbedded in the cell when it lays in the score. Then place the horizontal wire in its scores and fasten it. The post can now be laid in its score and the end allowed to rest upon the horizontal wire. The post should be slid back and forth until the end projects the desired amount above the horizontal wire. The post is now clamped in position with two small watch screws, or can be soldered with a blowpipe. The reticule should be carefully examined with a magnifier when completed and any dust or lint blown off the wires. A skillful operator can remove dust from a spider line with a sharp needle, but this is more often disastrous than not.

With a little practice and patience, the average rifleman can soon achieve the necessary dexterity to make for himself any reticule he may wish, quickly and economically.

DEN TALKS

(*Concluded from page* 15)

from which you expect to carry home the bacon, you are apt to make a big mistake. For when you have tightened the two large guard screws and then snap your trigger you may find that a change has taken place. The pull that was a regular dream of a pull a moment ago has become noticeably harder, or maybe softer and altogether too easy for safety. Worse than that, you may discover that the trigger that worked like a charm when the chamber was empty shows an entirely different behavior when a shell is inserted, due to the fact that the head of the shell compels the bolt to align itself with it.

All of which points the lesson that the final operation on or adjustment of the trigger pull should not be made until the piece is assembled in the stock and the pull tried with a shell in the chamber. There is a bullet hole in a certain attic wall that convinces me that an empty shell will serve the purpose better than a loaded cartridge.

FIELD REPAIRS

(*Concluded from page* 16)

mud. I climbed down to a little stream, cut a willow for a cleaning rod, and promptly got that rod stuck and broken off in the bore. I could do nothing with it until I got back to camp as the rifle was a Winchester, Model 1895, and I could not dismount the breech block to push it out with another willow rod. Since then I have always carried with me when hunting a pocket steel cleaning rod, having thin joints six inches long. It weighs only four ounces, and twice it has paid for itself in letting me clean the bore when hunting where otherwise I would have had to terminate my hunt for the day and go back to camp for the big rod.

American Riflemen

Send in your contributions for the 1922 United States Rifle Team and get *your* name on the "Roll of Honor."

Those Burst Revolvers

By CHAUNCEY THOMAS

SEE page 28, July 15 issue, query answer to "A Peculiar Accident." I have in my own hands split one six-gun the same way—end of barrel between cylinder and frame—and have helped split another, both .38 Specials, one Colt, one S. & W., and have been in touch with other guns so split. Before firing the second gun I predicted that the soft oversized bullet would probably split the barrel, and it did. Same load, same gun, but hard bullets worked all right. I never use less than rifle mixture, 1/16, in revolver reloads for this very reason. The cause is too soft a bullet, or too tight a barrel for the bullet used, or a barrel smaller in lands measurement than cylinder opening. The most usual cause is too soft a bullet, usually combined with the other two causes. It usually also occurs with a dirty barrel, which tends to make the lands bore a trifle smaller, perhaps.

The idea is this: The bullet comes from the cylinder and in contact with the restraining lands on the front part of the bullet; but the powder is pressing more and more from behind; the bullet has not yet got up enough speed to jam into the restraining barrel through its own momentum; so the bullet, if too soft, upsets into the funnel at the beginning of the barrel, then either resizes itself to the barrel, or splits the end of the barrel. This is much more liable to happen with square-nose than with bullets of usual tapered noses, as the tapered nose tends to pull the bullet into the barrel, also through momentum. If the cylinder is not locked, as very often happens in a much-fired gun, the accident is more liable to happen than with a clean gun, or a cylinder that is secured by cylinder catch before the hammer falls. I have often had the hammer hit on the edge of the primer, even off the primer into the brass, with all makes and kinds of six-guns, and when firing for groups, especially at long ranges, I always—now instinctively—with my left fore finger complete the revolution of the cylinder till the catch clicks.

This particular kind of accident will happen occasionally with factory cartridges, but most often takes place with reloads.

The same things happens more or less with a cartridge too short for the chamber now and then. The bullet, especially if larger than the cylinder opening, now and then upsets in the cylinder into the space left vacant by the too short shell. Then the bullet must either resize itself down to the size of the cylinder opening, or something bursts.

From a number of letters I have had from shooters during some years back about this very accident, and the evident lack of definite information on the subject by sundry makers of guns, cartridges and powders, I have used up considerable space here about it. When a man uses soft bullets, reloaded, especially undersized, in too short shells, like the short .45 Colt, the .44 Russian in the .44 Special chamber, the U. S. Government .38's or any .38 Long cartridges in the .38 Special chambers, he is going to uncover lots of grief if he keeps at it.

Personally, by long experience, I refuse to shoot any six-gun with a pure lead bullet, any heavy or near limit load with a square shoulder bullet, any cartridge too short for the chamber, or any gun where the barrel measures too small for the cylinder opening. I was born with only one right hand.

A Book for Sportsmen

By TOWNSEND WHELEN

THE latest addition to firearm literature is from the pen of Captain Paul A. Curtis, Jr., the shooting editor of *Field and Stream*. "Sporting Fircarms of Today in Use" (E. P. Dutton and Company, New York, $3.50), is written for the average American sportsman. It gives good, wholesome advise as to what weapons to procure for all kinds of shooting in North America. Unlike most such works it is in no sense technical. The author feels that there is already a wealth of technical literature on all kinds of firearms, and their use on the range or at the trap, and he has therefore confined himself to such information as the average sportsman who likes firearms, but has no interest in their strictly technical aspect, wishes to know.

There are three chapters on the rifle, two on the pistol, and six on the shotgun, and in addition chapters on arms for the sportswoman, the use of the compass, bird dogs, and field etiquette.

On the subject of the rifle, the author advocates a modern bolt action rifle, particularly a Springfield remodelled into sporting type, as being the last word in efficiency, and suitable for any American game. For those who are not hankering after the giant moose and Alaska bear, but who want a light rifle of light recoil, he recommends the 6.5 mm. Mannlicher Schoenauer rifle. There is nothing particularly new on the rifle, but what is said is said well and interestingly, and his advice is sound; just the kind of advice that should be given to the sportsman who knows next to nothing on the subject, and who is generally at the mercy of some ignorant salesman in the selection of a rifle.

It is on the subject of the shotgun that the author is at his best. He handles his subject as one who knows it thoroughly from long experience afield. Captain Curtis has had exceptional opportunities all his life in field shooting, including both this country and England. He knows what he is saying when he cautions the reader against the full choked gun for average conditions afield.

The next to last chapter is one for which every true sportsman will love the author. I have never read a better tribute to a man's best friend, the bird dog. As I read that chapter, I had only to look up from the book to see my own puppy having the time of his life pointing sparrows.

The book is full of good sportsmanship from cover to cover. It is well worth a place in a sportsman's library, and it should be read by every youngster at the game.

That Right Idea

By C. C. FINN

IN a recent number we noted "The Right Idea" by Mr. Brainard, and were very much worried by his reference to this club until we looked up the carbon copy and discovered that we had spelled "strictly" with a *t* and not a *k*. We hope that we will not be suspected of bragging, but we really believe that the Seattle Rifle and Revolver Club has hold of part, at least, of the Right Idea here in our relation with Fort Lawton where we hold our matches. For whatever benefit it may be to others, we will go into particulars.

In the first place we have found that the present commanding officer and all his predecessors are decidedly human and interested in rifle shooting and the rifle club. We therefore get acquainted with them and find out, especially, what things they do not want us to do. Every one of them has had in his mind some civilian habit which he did not like, and as these have always been reasonable we have cheerfully lived up to the requirements and our occasional lapses have been overlooked on account of our good intentions. We have always welcomed the officers when they wanted to shoot with us; which they have done much too little and we have had a few active members of the club from amongst the officers whom it has been a joy to compete with. Sandy Macnab was one of our members for a long time.

We have found that officers like to have the civilian club turn out well and shoot well. There is a desire in every post to excell in military matters and this covers the civilians who make use of the post facilities. We have, therefore, never asked in vain for assistance in the commendable effort to ruin the bull's-eye without hitting the white. It is very unlikely that there is a post in the United States with a target range where the civilian clubs will not receive a friendly reception if enough of them turn out and shoot half way well .

We have always hired soldiers to run the targets when we could. During the war there were privates at the Fort with incomes larger than a Major General and plenty more to whom a dollar or so meant nothing, but since the regulars are back we find that our job is welcomed. We pay the men well, so that they will like us and want to work for us, and they do work right and they take a personal interest in who is leading the matches, and how Dad Farr shot today, and "who the deuce was putting on all those bulls on target 5," and "Some poor fish got three 2's in succession on my target; new member, huh?" etc. With the consent of the Range Officer we paid the Range Sergeant a regular salary, during the three months of regular State Matches, to keep our target house in order and have targets, telephones and pit detail on the job every shooting day. The arrangement has been most satisfactory to us and the sergeant, being a married man, says that the extra pay didn't make his wife sore a bit. All of this cost us an extra dollar a year dues, four bits a week per shooter collected on the range, and we had $90 to spend for medals. For record firing we collected a dollar entrance fee, ran the full ten targets, had a phone operator on the line, sergeant in the pit for boss, qualified 26 out of the 26 who showed up, all experts but four, and they made Sharpshooter, paid the whole pit detail $3.50 each, and told them that the faster they handled targets the sooner we would be done, and we sure had a fine shoot with everyone pleased. The colonel detailed a captain for range officer, and he said that we shot so well that it was pure pleasure to watch us do it.

To sum it up, the Right Idea is clean and friendly competition, consideration for those about and enthusiastic shooters, which is, after all, the Right Way to do anything. We don't claim perfection, but we sure do like to enjoy our shooting in comfort and the above has brought us more comfort than anything we have ever tried. Incidentally, it has practically doubled our

average weekly turn-out, along with the drawing power of seven handsome medals, gold, silver and bronze for Class A, silver and two bronze for Class B, and one bronze for Novice. The membership is classified in accordance with known performance and ability, and medals are awarded for the *season total*, including record firing, thus making attendance necessary. This has proven a little too drastic and next year the medals will be awarded for the total of the best 10 out of 12 State Match scores and the qualification firing, providing that of the 10 matches selected one must be at 200 standing and not more than one at 500 prone, slow.

More About Practical Field Competitions

By W. M. GARLINGTON

I READ with interest and pleasure Captain Askins' article on trapshooting in the issue of June 1; also the comments of Ellerton James in the issue of July 1. Their views so closely coincide with mine that I am going to take the opportunity to express myself on the subject.

There is no denying the fact that trapshooting as now conducted is a class of shooting unto itself, and comparable in form to the bull's-eye system in rifle shooting. It bears no relation to any form of field shooting when it comes to simulating conditions and possesses but little if any value as a school for field work.

I have done but little trapshooting—not being able to fork up 6 to 7 cents per shot with any frequency, and what I have done has been done with a gun rather unsuited to this particular style of shooting. Yet I have managed to maintain an average of 90 per cent plus since firing my first shot at the saucers. This is not much of an average as averages go, but I frequently go six months without firing a shot over the traps. However, I frequently attend the big shoots here in Chicago in the role of spectator, so am pretty thoroughly acquainted with the game. I may be wrong in my opinion, but I believe that any one possessing any natural shooting ability, and the wherewith to pursue the game, should be able to register an average of from 95 to 96 per cent, i. e., if he concentrates and puts his heart into his work. For, as I have heard some of the best professional shots state, "it's all in learning the angles." To do that requires constant practice, just as does billiards, or golf, or rifle shooting. After watching numerous experts snuff out targets with monotonous regularity, and noting the number of shots they fire in the course of a year, it causes one to wonder that they miss any from the 16-yard mark.

Trapshooting as conducted at present wearies me, as it must weary anyone doing any amount of field shooting before trying his hand at the clays. A few weeks ago I attended a picnic given by an Indiana Fish and Game Protective Association. In addition to other contests there were clay bird shooting events. We shot over hand traps at 22 yards. We got 'em at an angle, straight away, straight up, straight incomers, and incomers at an angle. We missed some—some of the boys missed lots, but I have not enjoyed myself so much since the last time I swung my pet "twenty" on a buzzing quail in Southern Florida some five years ago.

To anyone experienced in field shooting trapshooting as now conducted is a poor substitute, and of no value as a developer of wing shots. However, it could be revamped into an excellent substitute for field shooting and turned into a very good school for the development of field shots. Instead of the gun-at-the-shoulder, fixed flight system now in vogue, which is slightly varied by the so-called "unknown angle" flight—(most experts call the angle 9 out of 10 times)—have the shooters walk up on the target, as on jacksnipe, quail, or grouse, and spring the trap unawares. Then vary the programme by simulating duck shooting on straight incomers, quartering incomers, etc. Let the shooter start to walking up on his target at, say, from 25 yards, and spring the trap at a rise of, say, 10 to 5 yards, and regulate the trap to throw targets about 40 yards, for the reason a target leaves the trap at its maximum speed, whereas game birds of the species mentioned flush at their minimum speed. A 60-yard target would get away too quickly under such conditions. In addition, vary the angle of height from low ground skimmers to high rocketers, and provide doubles shooting under these conditions also.

In events simulating duck shooting the full power of the trap should be used and the rise put at, say, 40 yards. This would give the shooter time to size up the target before it was overhead, yet would give sufficient flight power to carry it 20 to 30 yards past him.

Institute such reforms as advocated above, and watch the 100 straights and 590x600 scores fade from the scene. Also, listen for the yowl of the cut and dried, machine-like, gun-to-the-shoulder trapshooting market hunter. But it is quite safe to say that such reforms could not be introduced, for their introduction would necessitate a reduction in the number of targets shot at by each shooter in the course of a shoot. And there is nothing which causes ammunition makers to smile quite so contentedly as the "Pull-Bang! Pull-Bang! Pull-Bang!" of the present system.

Many times have I heard the present form of trapshooting referred to as a wonderful sport, or the sport alluring. There is no doubt but what it is to many—especially to those unacquainted with real honest-to-goodness field shooting. It could be made alluring through the institution of reforms somewhat along the lines of those I have suggested, but the day will never come when I will consider the sport derived from trapshooting as now conducted in the same breath with that I have derived from days afield in pursuit of the sporty Bob White, the jacksnipe, ducks, and the wily turkey. And the human does not live who loves a gun or loves to hear the crack of nitro better than I do.

American Legion to Shoot

AMERICAN Legion Championship Rifle Meet of the Fourth Annual Convention, will be fired on the State Rifle Range, Metairie Ridge, Lousiana, next October.

Regulations Governing All Competitions

Rifles: To be Government Springfield, Model 1903, as issued.

Sights: Any metalic sight not containing glass.

Ammunition: 150 grains.

Firing regulations other than shown on program: To be governed by U. S. Rifle Marksmanship 1920.

Matches to be Fired

First day: One team from each State consisting of four firing members of The American Legion, one alternate and a team captain who may be a firing member of the team.

Course to be Fired

200 yds.—RF target D ten shots for record from standing to sitting or kneeling. Time 1 minute 5 seconds.

300 yds.—RF target D ten shots for record from standing to prone. Time 1 minute 15 seconds.

300 yds.—SF target A ten shots for record. Sitting position.

500 yds.—SF target B two SS and ten shots for record. Prone.

Second day: All Comers Match.

Open to any member of The American Legion.

Course to be Fired

600 yds.—SF Sand Bag Rest.—Target B two SS and fifteen shots for record.

TROPHIES AND MEDALS TO BE AWARDED

To the Four Man Team Match

To the winning team of the Four Man Team Match: A trophy and a gold medal to each member and the alternate.

To the second team of the Four Man Team Match: A silver medal to each member and the alternate.

To the third team of the Four Man Team Match: A Bronze Medal to each member and the alternate.

To the man with the Grand High Aggregate of the Four Man Team Match: A Gold Medal.

To the man with the second High Aggregate of the Four Man Team Match: A Silver Medal.

To the man with the third High Aggregate of the Four Man Team Match: A Bronze Medal.

Medals to winners of All Comers Match

To the individual winning first place: A Gold Medal.

To the individual winning second place: A Silver Medal.

To the individual winning third place: A Bronze Medal.

The Trophy for the Four Man Team Match to be competed for annually and not to become the permanent property of any American Legion Department until a team representing such department has won it three times.

E. C. NOCHOLS.
G. L. SHAW.

Hillsboro Won Match 9

AN error in addition led the announcement of the George Washington University as winner of Match No. 9 of the N. R. A. series when Hillsboro, Ohio, actually won the match. Hillsboro's score was 1937 and George Washington's was 1935. This error is regretted by those in charge of the scoring, and the silver medals which go to the winner of the event have been sent to Hillsboro.

The Van Schiver Trophy

THE bronze statuette which was awarded in the Small Bore Palma Match at Sea Girt during the July meeting will be known as the Van Schiver Trophy, it having been presented by the Van Schiver Furniture Company of Camden, N. J.

This gift to the small-bore shooters came about as the result of the efforts of the Camden, N. J., Rifle Club, and Lieut. George Scott, of that organization, states that the club is working to add other trophies to the list.

More About Positions

By C. T. PATTERSON

NOTE Mr. R. Wiles comments of positions in the May 15 issue; found the same trouble myself and to overcome it have equipped all my rifles with a beaver tail forend—that is, with a taper with large end to the front and coarse checking.

In a letter from Major Whelen he does not agree with me on this, stating "that it is more desirable to keep the hand from slipping backward than forward and that the sling will keep hand from slipping forward," and he is correct, provided the sling swivel is at just the right spot for the particular man using the rifle, but sling swivels can not be changed easily and this thing of jamming the hand tight against the swivel is not what it might be—note the padding used by lots of shooters, also give the novice the rifle, jam his hand against said swivel and see how many shots he will fire and keep his hand there.

Major Whelen is right again when he says that the left hand must pull backward during rapid fire and the coarse checking I use takes care of this nicely, while the broad end forend and checking takes care of the tendency for the hand to slip forward and the exact position of the swivel can be disregarded, the darned thing is always wrong, either when shooting prone or sitting, if right for one, 'tis wrong for the other when we try to jam the hand against it.

This is only my experience, contrary to Whelen, and he has had a lot more than I, but maybe this would help out Mr. Wiles or others who are having some trouble; can't guarantee satisfaction as I'm a danged south-paw shooter and what works with me maybe won't with a right-balanced shooter.

Please get Major Whelen's comments on this and ask him to be easy on me.

Left Eyes and Right Shoulders

By J. T. LAWLESS

IN ARMS AND THE MAN of June 15 issue, I read with very much interest "Left Eyes and Right Shoulders," principally because I am one of the clan of left-handers, and I know very well the disadvantages the "Lefty" labors under at times.

I am not at all familiar with off-cast stocks, but having done considerable shooting with the left eye and left shoulder, I desire to submit a few suggestions which may be of interest.

The greatest difficulty lies in bolt manipulation and reloading at rapid fire. Mr. Thomson's method of working the bolt, keeping the piece at the shoulder, is a very good one. On the subject of reloading the piece in rapid fire, I have a pointer that I have used for several years, and I am sure that if you lefties will give it a try-out, you will finally agree that the lefty has some advantages. That may sound like bunk, but try this: When you lower the piece to reload the magazine, roll the piece, barrel to the left, away from you, sliding the butt to the left rear until the piece is in such a position that you will be looking directly into the magazine from the right side, and not from the top. Place the clip in position, and with the four fingers working from the right side, thumb on magazine floor plate, press equally with all four, and presto—they go home like magic. With a little practice you will have the confidence of a right-hander, and seldom, if ever, spill a clip.

Now for the subject of the lefty on the firing point. We all know he is often out of luck and too often causes the right-hander many inconveniences. Mr. Thomson's suggestion that all lefties be squadded in the same relay is very good from many angles, but it should not be done. To do it would spoil our system of squadding. I for one prefer to be squadded as an individual and would not welcome being put into any class. When shooting one man on a target, there is enough room on a target. A lot of inconveniences would be eliminated if the shooter was allotted all the space between and at right angles to the stakes, with the scorers bench in the center of the space, and not behind the stake. When two men are shooting on a target in team matches, quarters are pretty tight. Last year at Perry, during some of the matches, a team was permitted to shoot a lefty and his pardner singly. This worked out very good, and although Colonel Mumma favored the arrangement, the rules would not permit of it in the National Team Match. Therefore, it is suggested that the rules be changed to allow any team, if they so desire, to fire left handed men and their pardners singly, at the 600-yard range, with no additional time allowance for the team.

The Swiss Rifle

By C. D. MEYER

IN the answer to G. R. H., Richmond, Ind. (Aug. 1, 1922). In regard to the Swiss Schmidt Rubin Rifle you say that this cartridge has practically the same size head as the .30 calibre, 1906, and is of about the same pressure and velocities.

The following information may be useful: Rifle Model 89, calibre 7.5 mm. magazine holds 12 cartridges, loaded as follow: 2 grams of special powder, bullet weigh 13.8 grams, gas pressure 2,600 atmosphere, velocities 610 metre per second; energie 261 kilogrametre. Rifle Model 1911, calibre 7.54 mm. magazine holds 5 cartridges loaded as follows: 3 grams (46.3 grains) powder, bullet 11.3 grams (175 grains), gas pressure 3,200 atmosphere (47,000 pounds), velocities 810 metres (2,656 feet) second, energie 378 kilogrametre.

In other words, Model 89 is about equal to the Krag, and Model 1911 is equal to the Springfield.

These Dark Horses

By "AL BLANCO"

THE Metropolitan Rifle League held a special shoot on the range of the Montclair Rifle Club over in New Jersey on Sunday, July 30. The Executive Officer was George Schenck. All of the shooting was at 500 yards on the regulation target B, 20-inch Bull's-eye, with inner rings giving a count of 5, 4 and 3 in the bull's-eye and hit on the balance of target counted two. The center of the bull's-eye, 8 inches in diameter, counted 5. The four rings measured 3 inches from the five-ring, and the three-ring 3 inches from the four. This is rather a complicated way of expressing the proposition; but the idea is to mystify those who are unable to solve simple problems.

In this connection, it should be stated that C. W. Tilley, of the Arlington Rifle Club, had no trouble solving the bull's-eye, as he came forth winner of the match with a score of 66 out of the possible 75, winning over such fancy performers as J. W. Hessian and L. J. Miller, who got 59 and 55, respectively.

The conditions called for 15 shots and it was a regular squadded match.

The outstanding feature of the shooting of Mr. Tilley is the fact that he is a small-bore shot of large experience. Somebody told him that he would have a pleasant time watching a military rifle shooting contest at Montclair and that some very fine shots would be on hand to demonstrate that it is possible, even by cutting up the bull's-eye into small sections, to induce the boys in the pit to raise the white disc more frequently than the red or the Maltese Cross. So the aforesaid Tilley borrowed him a rifle from an unsuspecting friend; made a quick purchase of some very famous 180 grains match ammunition, said to hold all American records for all distances, including such suburban countries as England, Sweden, Australia and Canada. With a borrowed score book and a final word of advice from the aforesaid unsuspecting friend, the timid Mr. Tilley selected a nice soft spot on the rocky slopes of Upper Montclair and took his first peep through the iron sights of the regulation Springfield. It looked "alle samee like small bore Springfield only the recoil was different," he said, as he rubbed two or three elbows and glanced ruefully at the jagged rocks beneath him. But these Arlington Rifle Club fellows have a habit of sticking to anything they happen to get hold of; so Friend Tilley got another toehold and prepared himself for a long grind. It wasn't so long after all, because after the first few shots he got used to the experience of being pushed back five feet every time he moved forward one; and got his mind actively centered on the proposition of making the boy in the pit let him see after each shot what the white disc looked like. By way of variation he occasionally shoved up a red one; and once to prove that he had one in the pit, he raised the Maltese Cross.

The Englishmen called this a "magpie," but we prefer to call it by another name—just to be different. However, when Tilley painfully raised himself in a position to view the scoreboard, he saw something like this:

C. W. TILLEY	5	5	5	4	4—23
	5	4	4	5	4—22
	4	3	5	5	4—21
					Total—66

Somebody told him that it was remarkable shooting and, naturally, he thought he was being "kidded;" but when he strolled along the line and squinted hard on a score of 59 made by Hession and 55 made by Miller, with nothing higher in sight, he began to take a little more interest in life. It soon developed that this was the top score—and 66 was the best score made by any of the 21 contestants.

The ammunition used was "Palma Olympic" of Remington make.

There is food for reflection in this fine performance and, among other things, it indicates that the small-bore shot may readily take up military rifle shooting with the big gun and benefit tremendously from the experience of shooting at short distances.

The Contingent Fund

CONTRIBUTIONS from these friends of the International Team were received up to August 15:

Charles M. Wood.....Chambersburg, Pa.
Erwin Spencer.....Philadelphia, Pa.
H. L. Opie.....Staunton, Va.
Edward C. Delafield.....New York, N. Y.
K. H. Fichtmer.....Brooklyn, N. Y.
William H. Weiss.....Pottstown, Pa.
Mortimer L. Shiff.....New York, N. Y.
M. M. Hedges.....Chattanooga, Tenn.
Alapoco Club.....Gorgas, Ala.
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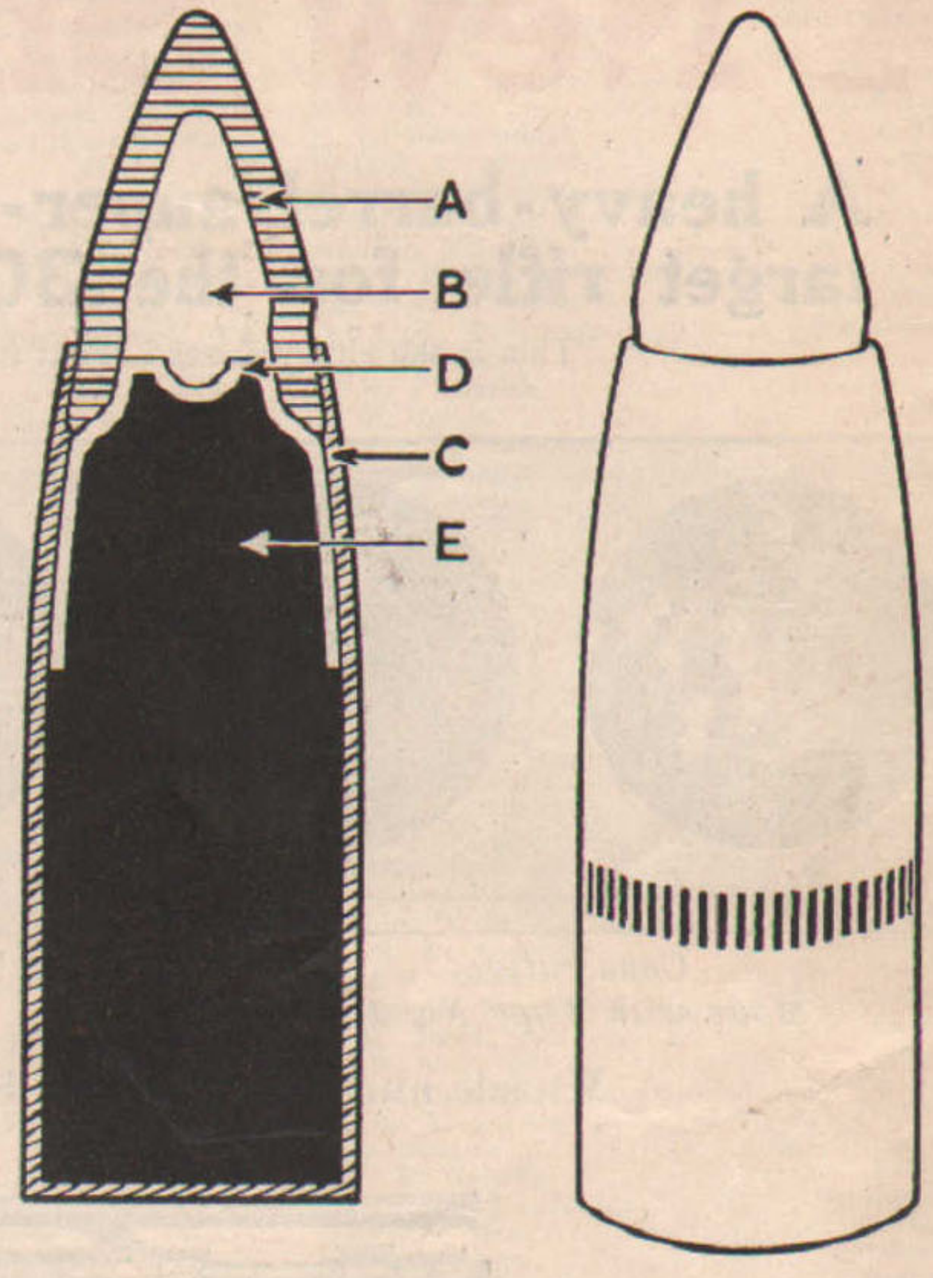
(*Continued on page 33*)

Killing Power!

The New Peters Game Bullet



BIG game hunters—here's just what you've been looking for—a bullet that has maximum mushrooming and penetration combined. Note the cross-section view. The tip (A) over the point prevents deformation in the magazine. On impact, the air in the chamber of the tip (B) is compressed, causing the instantaneous expansion of the jacket (C) which deforms the whole bullet, inflicting great damage to an animal on passing through its body. So that this bullet will retain its penetrating force a cup (D) is placed over the end of the slug (E). This cup prevents the slug from breaking up.

In this Protected Point Expanding Bullet, the Peters Cartridge Company has succeeded in overcoming the defects in the game bullets now on the market—and is now ready to give you the results of the exhaustive experiments and tests necessary to perfect this new product.

This bullet is now being loaded only in .30-1906 Gov't Cartridges, but it is planned to have it supersede all soft nose pointed bullets from .25 calibre up.

You will be amazed at the killing power which this bullet delivers.

The Peters Cartridge Company, Cincinnati, Ohio

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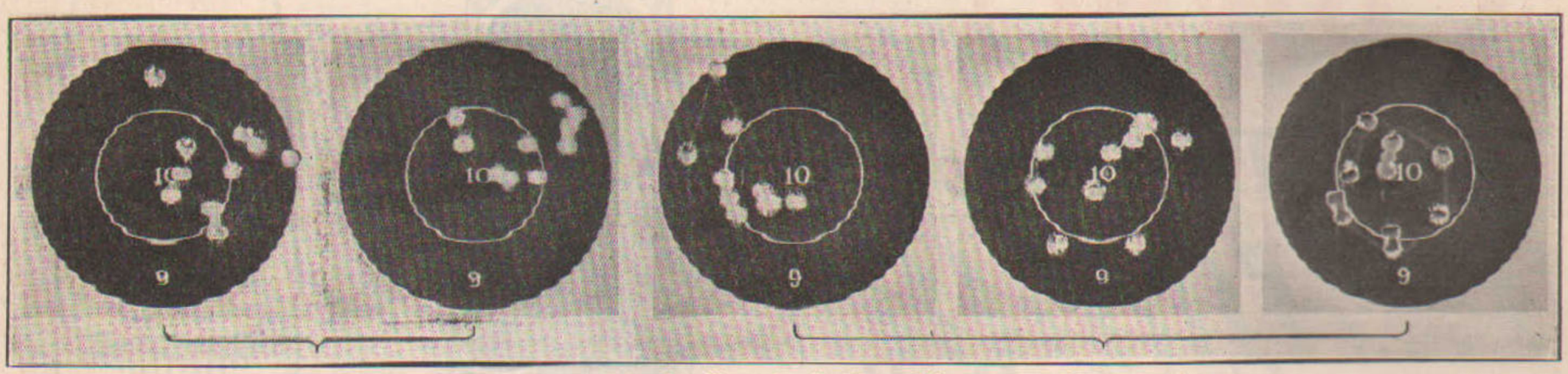
A New Sniper's Rifle

A heavy-barrel, super-accurate, long or short range target rifle for the .30 U. S. Government cartridge

This is the rifle you read about in August 15th number of ARMS AND THE MAN.



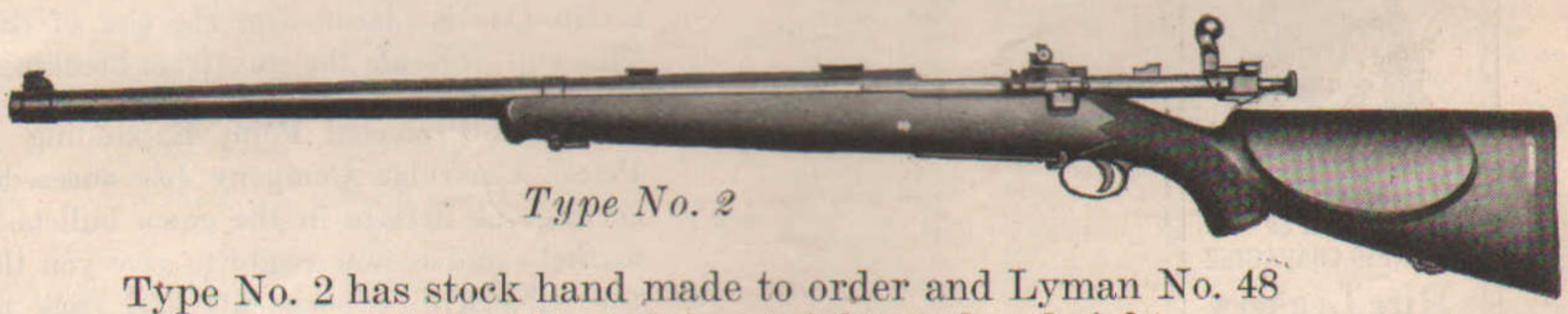
Consecutive Four-inch Black, Two-inch Ten Ring *Consecutive*
Made with Type No. 1 At 200 Yards *Made with Type No. 2*
Muzzle and Elbow Rest: Small Bore, N. R. A. 100-yd Targets

Type No. 1

The following specifications are common to both types:

Winchester 26-inch nickel steel barrel made to Government standard in groove and bore measurements and with Winchester quality finish.

Diameter at receiver end 1⅛-inch, diameter at muzzle end ⅞-inch. Springfield action. Thoroughly tested for accuracy. Service stock with fitted pistol grip. Plain service rifle trimmings. Barrel based for Winchester A-5 telescope sight.



Type No. 2

Type No. 2 has stock hand made to order and Lyman No. 48 receiver sight, specially adjusted front sight stud and sight.

Prices and Complete Specifications upon Application to

Shooting Promotion Division

WINCHESTER REPEATING ARMS COMPANY

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Maximalian Toch.....New York, N. Y.
E. L. Smith.....Buffalo, N. Y.
Russell B. Lowe.....Fitchburg, Mass.
Chester Berry.....Worcester, Mass.
W. U. Lott.....Forest City, Pa.
E. Ronquette.....Covington, La.
Horace W. Chapman.....Bangor, Maine
Raymond H. Clapper.....Amsterdam, N. Y.
Paul V. Bacon.....Boston, Mass.
A. M. Weaver.....Harrisburg, Pa.
F. C. Cowan.....Arrowsmith, Ill.
Wm. N. Curd.....Richmond, Va.
S. E. Crutcher.....Maxwell, Calif.
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Seattle Rifle and Rev. Club.....Seattle, Wash.
Ernest Bugh.....Cleveland, Ohio
W. J. Coleman.....La Salle, N. Y.
George M. Fitze.....Forest City, Pa.
Al. A. Hansen.....Rosebud, Mont.
Martin Nordstrum.....Johnsonburg, Pa.
Wm. Rohrbacher.....Erie, Pa.
F. P. Lauffer.....N. Warren, Pa.
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Wm. B. Pape.....Annapolis, Md.
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F. J. Fox.....Rochester, N. Y.
G. W. Double.....Bradford, Pa.
S. T. Fonda.....Schenectady, N. Y.
Leslie J. Jacobs.....Candor, N. Y.
Jos. E. Cilley.....Hickory, N. C.
Wm. B. Hibbs.....Washington, D. C.
Wm. I. Simmons.....Farmington, Mich.
Edw. H. Proudman.....New York, N. Y.
George W. Ridge.....Champaign, Ill.
E. W. Tanner.....Yonkers, N. Y.
L. B. Mitchell.....Tampa, Fla.
J. W. Dlouhy.....Chico, Calif.
Selden E. Lord.....Akron, Ohio
W. R. Thorson.....Ames, Iowa
Albert L. Zabriskie.....Hawthorne, N. J.
Ettore Minervini.....New York, N. Y.
Lynn M. Gable.....Hegins, Pa.
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Alden Brooks.....Sheridan, Wyo.
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S. R. Truesdell.....Marshfield, Wis.
Chas. H. Engelfried.....Rocky River, Ohio
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M. Calhoun.....Schenectady, N. Y.
L. F. Cook.....Marysville, Ind.
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Wm. H. Schinke.....Greenville, Ohio
Stephen Royce.....Crystal Falls, Mich.
Nick Arnet.....Cut Bank, Mont.
J. D. Perdue.....Whitefish, Mont.

AMERICAN INTERNATIONAL RIFLE TEAM

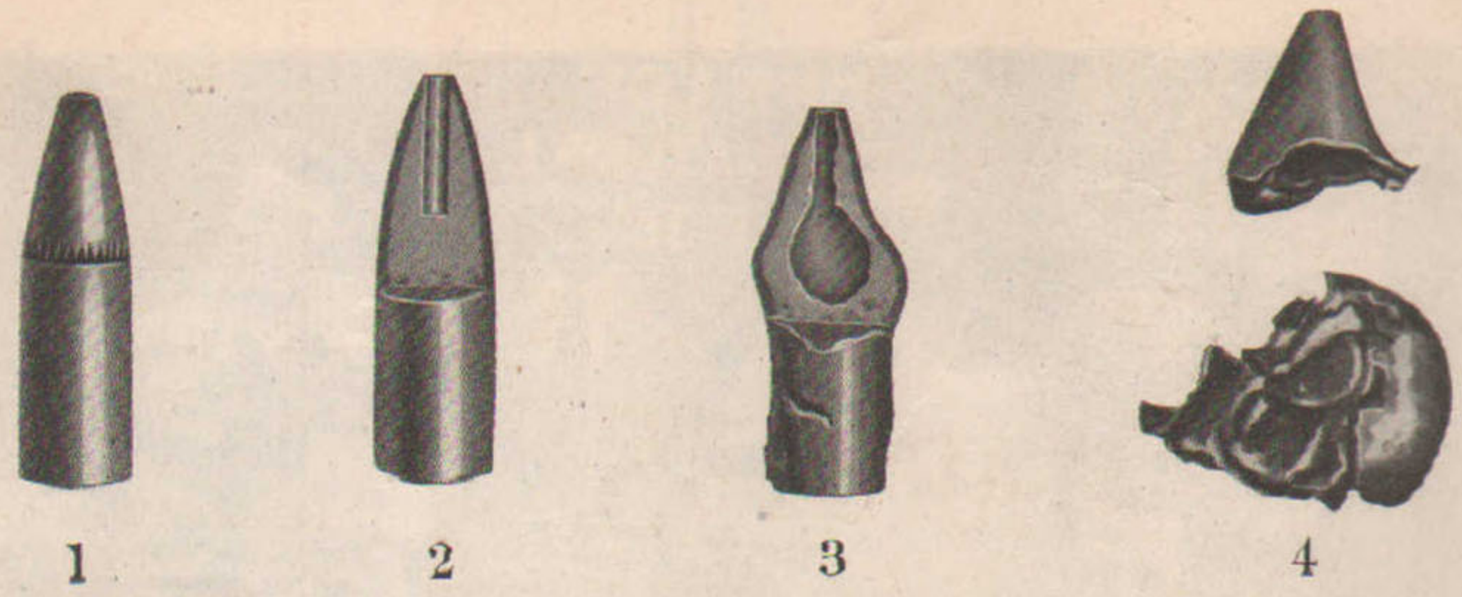
Standing, left to right—Capt. Joseph Jackson, U. S. M. C.; Lieut. Com. A. D. Denney; Mr. Lawrence Neusslein; Sergt. Morris Fisher. Sitting, left to right—Major J. K. Boles, U. S. A.; Major L. W. T. Waller, U. S. M. C., Team Captain; Lieut. Com. C. T. Osburn, U. S. N., Team Coach. Not shown in photo—Mr. W. R. Stokes; Mar. Gun. C. A. Lloyd, and Lieut. Com. E. E. Wilson, U. S. N.

They All Shoot HiVel

THIS is the rifle team that will represent the United States in the International Matches at Milan, Italy, in September. It was chosen after a closely contested three-day tryout in which much exceptionally accurate shooting was done.

Every one of these men, as well as sixteen out of the seventeen high men in the tryout, shot HiVel. The team will use HiVel in all of the matches in Italy.

This is the fourth year in succession that the American Rifle Team has placed its dependence upon ammunition loaded with HiVel. You can do the same—with perfect confidence—at both Sea Girt and Camp Perry.



1 2 3 4

The Giant Killer

When this bullet hit a big bull moose at long range, he dropped in his tracks without a quiver. This is not at all an unusual performance for the Western Open-Point Expanding Bullet. Sportsmen repeatedly obtain these same remarkable smashing results on the toughest big game —moose, grizzly, brown bear and mountain lion.

Western
Open-Point Expanding Bullet

The Western Open-Point Expanding bullet is a full metal patched bullet which is equally well adapted to ordinary rifle practice and hunting purposes. It penetrates the toughest hides and delivers a terrific smashing blow that overcomes resistance in both bone and sinew.

In the illustration above (1) shows the Open-Point Expanding bullet with the Western Lubaloy non-fouling jacket. At (2) is shown a section of the bullet with a portion milled off to show the air pocket. At (3) the progressive action of the bullet is indicated. When the Open-Point bullet strikes the animal tissue, the effect is to close the air pocket and thus trap the air within the nose of the bullet. As the bullet penetrates the terrific pressure exerted on the trapped air in the pocket expands and bulges out the sides of the bullet. This action continues until the bullet has mushroomed to the fracturing point when it explodes as shown in the fourth illustration. At (4) is shown the spent bullet completely expanded. This is the bullet that was taken from the vitals of the moose referred to above.

Western Open-Point Expanding Bullets are furnished with the Lubaloy non-fouling jacket in the following sizes:

250-3000	100 gr.	30-06	150 gr.
25 Rem.	100 gr.	30-06	180 gr.
6.5 Mannlicher	140 gr.	30 Newton	180 gr.
256 Newton	129 gr.	35 Newton	250 gr.

The United States Government is now considering the adoption of Lubaloy or similar metals for use on all military service bullets in order to prevent metal fouling. The U. S. Rifle Team will use Western Ammunition loaded with Lubaloy bullets at the International Matches to be held in Milan, Italy.

Ask our representative at Camp Perry
or write us for full particulars

Western Cartridge Co., East Alton, Ill.

Western TRADE MARK

"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.

MAJOR WHELEN'S SERVICES TEMPORARILY DISCONTINUED

ANNOUNCEMENT is made that the services of Major Townsend Whelen in connection with the Dope Bag are temporarily discontinued. Major Whelen leaves September first on a hunting and exploring trip to a little known portion of the Canadian Rockies just south of Peace River, and he expects to be gone about two months and a half. The region is an extremely interesting one as it is one of the few stretches of the Rockies that has never been explored. All species of big game are very plentiful. This is practically the first holiday that Major Whelen has had since 1916, during which time he has done an enormous amount of work. He well deserves this little rest and recreation, and our best wishes for a successful trip and lots of sport go with him.

THE MARLIN .30-30

I THANK you for the information which I received from you some time ago concerning the Marlin .30-30 carbine. I have heard a good deal about the Savage .250-3000 and .300 rifles, would you please tell me if these are more accurate than the .30-30 Marlin carbines, and what is the accurate range for these rifles, and how will they group the shots on the target for 100, 200 and up to 500 yards? Is the .250-3000 Savage rifle a good game rifle?

S. H., Racine, Wis.

Answer (by Major Whelen): The Marlin .30-30 carbine is quite an accurate little gun, but the Savage .250-3000 cartridge is slightly superior to it in accuracy. The stiffness of the whole rifle has a good deal to do with accuracy. The Marlin carbine, not being a take-down, will shoot quite accurately. The Savage Model 1899 rifle with lever action, being a take-down, even if it does use the .250-3000 cartridge, will probably not shoot as accurately as the Marlin .30-30 on account of the take-down, but the Savage bolt action rifle with solid frame for the .250-3000 cartridge will probably give you better accuracy than the Marlin .30-30.

The Marlin .30-30 is not accurate enough for game at much over four hundred (400) yards, but the Savage .250-3000 in bolt action should shoot very accurately up to six hundred (600) yards. Groups with the .30-30 at two hundred yards should be about six inches (6"), and with the .250-3000 at two hundred yards about four and one-half inches (4½").

A GUN FOR TEXAS GAME

I AM intending to have a 20-bore gun made this year for quail shooting. Want to know whether to get full, quarter or half choke cylinder or cylinder barrels for this gun. What drop do you consider best in stock, and do you find single trigger double in small bore as reliable as in larger? Have you used any of the 20 gauge pump guns now on the market by Marlin or Winchester, and, if so, what do you think of them?

Any information I can give you in regard to hunting in this State or in Mexico will be gladly given. Have hunted all over Texas for quail, deer, turkey, etc., and most of Republic.

Thanking you in advance for your information.

L. E. F., Hood Co., Texas.

Answer (by Captain Askins): The proper 20 bore for Texas shooting, I think, would be a quarter choke first and a half choke second barrel. In the east or north I'd have it improved cylinder and quarter choke, but it always seemed to me that Texas birds got up a little wilder than those in the east or across the Mississippi in the south.

It is pretty hard to fit out another man with a stock. I shoot 14⅛, long 2½ drop, 1½ at comb, in double barrel. Pump gun is about 14, 2 9/16, 1½. If you are accustomed to more drop than 2⅝, 1⅝ might suit you better.

I haven't used the Marlin 20 much. Thought it pumped a little harder than a Winchester. Like the Remington better than either because of its smooth action. I think there is no particular difference in the shooting of these guns.

Never found any difference in the working of a single trigger in 20 gauge and 12. I have one on my Fox that has been behaving very well for half a dozen years. I think the Hunter single trigger would, too.

I am going to New Mexico this year with the hope of getting some quail shooting, more than anything else. Maybe you can tell me of some point in North or Central Texas where I could find game, quail, turkey, deer, ducks, or anything else. I have hunted some in Texas, down on the Nueces River below San Antonio, nowhere else.

A RIFLE FOR CROWS

I AM a gun crank and have been since childhood up, and I am up against it now as to knowing something, and so am forced to question you (if you permit) as to a few thing which I would like to know.

Now, I have a Savage 1919-.22 rifle, shooting the well-known .22 long rifle cartridge in it. I also bought a Stevens 438, 3½ power, 14-inch telescope sight for it. Now, as I do most of my shooting around Toledo, and as I never belonged to a rifle club before, I like the hobby of shooting crows, woodchucks, etc. Now, as I am a long range nut, lots of times I was out hunting with the above gun and I had chances at the above game at 200 and 250 yards, but, as you know, the .22 long rifle cartridge is no good for hunting up to the above ranges, on account of too much drop, air resistance, etc. And as I read in our good magazine, "Arms and The Man," that when out shooting in a competition with the small-bore rifle at 200 yards each man is allowed two sighters at the target. Now, you know that when hunting crows at the above range that the crow isn't going to give you two sighters. You have to hit him the first time or you miss him and away he's gone. I was out lots of times to a big place of still water, here, and I measured the ranges off, 200 and 250 yards, and I threw in a block of wood, which was about ten inches in diamter, for a target. I also tied a heavy cord to the block and anchored it down so as to hold it in place. I went out lots of times and set my sight for the range I was shooting at and as I shot at the prone position I hit the block 7 and 8 times out of 10 shots, and when I got done shooting I didn't disturb the sight a bit, but went home and left the sight on the gun and went on ahead and cleaned my rifle. The next day I went out again, leaving the sight like it was the previous day and I shot again at the block, and in testing it out it did (now, mind, there wasn't any wind blowing on either day, but the second day was a little warmer, and I tested it out at the same time, between 11 and 12 o'clock) not shoot the same. I judged the hits about 16 inches in front of block.

Now, when you consider the drop, windage and every-day changes of weather when shooting a twenty-two at the game which I mentioned, it's too much of a handicap. I like the twenty-two for that matter; it's a good gun, because of its cheapness of ammunition, and we already knocked crows off of the tops of rotten trees with it at 200 yards, but, mind you, I was on my post all day, and I shot at objects in the water, right alongside of the roosting tree, so as to have my sight set correct at all times, should there a crow light in the roosting tree, which I have already targeted. I also have a silencer on my Savage when shooting crows, because if I didn't he would fly from the report of the rifle before the pellet gets there.

But you take walking around, and when you spot a crow some distance away, like 200 yards, getting your sight set and using a .22 rifle, it's too much of a handicap. Nine times out of ten you miss.

Well, I guess I don't have to write any more on the above subect and gun, and the experience I had, because you possibly, major, know that yourself.

But what I want to grind at is, I would like to have you recommend to me one of the Savage high power makes, so as to overcome all the above talk and squabble, one that is better suited to my means, and one of the take-down type. I have in mind their .22 high power, or .250-3000, and I intend to use the new Western lubaloy ammunition at all times, and one which I can attach my Stevens 438 telescope sight on, and make sure that it will stay on the gun from the shock of recoil, etc.; and one thing, and the most important of all, is its accuracy or group radius at 200 and 250 yards, because, you known, the crow is a mighty small object to hit. And again I would like to know what kind of cleaning chemicals do you use in cleaning a high power rifle when using the Western lubaloy ammution?

I was downtown in a sporting goods store the other day and I saw and handled the two guns which I mentioned. I would like to have one, but what its accuracy is, and if my telescope sight will work on one of the two, that I don't know, and that's why I am writing you this letter for information.

I would like to use the same gun for hunting deer up north when the season is in, and again I don't know whether I would dare to use it on crows in a settled community.

W. G., Toledo, O.

Answer (by Major Whelen): I have received your letter of recent date, relative to a rifle for shooting crows. First of all a great deal depends upon the country in which you are hunting. In some settled communities it is absolutely unsafe to fire at crows in trees with any rifle over the .22 calibre. If you are in an unsettled community, however, then you can use practically any rifle for this purpose so far as safety is concerned.

The Savage .250-3000 in bolt action form is accurate enough for your work; that is, it is as accurate as the .22 calibre long rifle, and, of course, has a very much flatter trajectory. The Savage .22 high power rifle is not accurate enough for shooting at crows as a general rule, nor is the Savage lever action rifle with any cartridge accurate enough on account of the take-down. Probably the very best rifle of all would be the Niedner rifle for the .22 calibre Niedner high power cartridge; the barrel to be placed in a Winchester single shot action, and the barrel to be very heavy.

There is a considerable variation in point of impact from day to day, particularly with light barreled rifles, and with take-down rifles. This, you say, you have already run into. The stiffer you get the action of a rifle, the tighter the barrel is screwed into the receiver, and the heavier the barrel, the less variation there is from day to day.

The Niedner .22 calibre is a little bit light for deer shooting. The Savage .250-3000, however, is quite suitable for such game.

RELOADS FOR THE .45

I DESIRE to reload .45 calibre revolver cartridges, Colt, for use on 20-yard target and would appreciate your instruction in regard to kind of powder, grains, kind of bullet and weight; also if it is possible to buy same ready loaded for this range. The full charge is entirely too heavy for comfort.

L. J. M., Chicago.

Answer (by Major Hatcher): The old black powder load for the .45 calibre Colt revolver cartridge gives an excessive recoil, and is rather unpleasant to shoot, but the smokeless load for this cartridge is not bad. If you have been using some of the black powder cartridges recently sold by the government, you might try the rgular smokeless load, as sold commercially, and if this is too heavy, it will be necessary for you to load your own, as the cartridge companies do not put out a mid-range cartridge in this calibre.

The full charge is a 255-grain bullet with five (5) grains Bull's-eye. A good reduced load is made by using Bond bullet A-454550, which has 184 grains of lead, or Bond bullet B-454510, which weights 190 grains. With either of these bullets, use three (3) grains of Bull's-eye powder.

LUGER AUTOMATICS

CAN you give me some information on Luger automatic pistols? I have a 9 mm. Luger which bears the date 1916. I know that the Lugers made before the war were good guns, and I also know that the post-war Lugers are not so good. I do not know, however, just where this 1916 Luger would rank.

Can you tell me if this is a good gun. Is it as good as a pre-war Luger? About when did the Germans begin to make poor quality Lugers?

W. J. W., Goshen, Ind.

Answer (by Major Hatcher): The careful finish

which was an inherent part of the design of the Luger pistol, as well as of most other German automatic arms, was continued until the demoralization set in in the latter part of 1918. I think that your 1916 Luger is probably a very well made arm. The worst specimens of worthless German junk are the military arms which were converted or refinished for export to America after the Armistice.

AN AMERICAN REVOLVER

I HAVE a revolver which is in need of repair. On the barrel is stamped American Arms Co., Boston. But I understand that the above company is not making the revolvers now. Would it be possible to obtain parts for the revolver from some other concern. It is a hammerless .38 calibre

N. H. J., Berlin, N. H.

Answer (by Major Hatcher): If the firm you mention has gone entirely out of business the only way you can have your revolver repaired would be to have a gunsmith make the missing parts, which would probably cost more than the gun is worth. I would advise you, however, to address the firm direct, as it is possible that they may still be in existence, and, if so, they might have some parts in stock, even if they no longer make the revolver in question.

BALLISTICS OF THE .45

I WOULD request information of you in regard to the .45 Colt automatic shooting power; also its comparisons with .45 Colt revolvers and 9 mm. Luger. What is the trajectory of bullet with the service load at extreme range and what is that range?

Trajectory at 25 yards, 50 yards and 75 yards?
Extreme range for accurate shooting?
Rapidity of shooting fire?
Velocity of bullet at muzzle at 25, 50 and 75 yards?
Penetration of bullet at 25, 50 and 75 yards?
Accuracy and power as compared with .45 calibre Colt revolvers and 9 mm. Luger?

Could you tell me if pistols and revolvers are procurable from the government through the N. R. A.

Are holsters for Colt .45 calibre pistols procurable through the D. C. M. (government model).

W. J. C., Roxbury, Mass.

Answer (by Major Hatcher): The following table gives the comparison you ask for:

Name	Weight bullet	M. V.	Energy	Penetration 7/8" board	Accurate range yards
.45 Auto.....	230	802	329	8	100
.45 Auto.....	200	919	378	8	100
.45 Colt.....	255	767	333	6	100
9 mm. Luger..	124	1014	284	10	60

The government .45 Auto. cartridge has a bullet of 230 grains weight, and the commercial type has a 200-grain bullet. Both cartridges can be used in the same gun. The accuracy ranges given above are from the figures of a large cartridge company, but figures like this must necessarily be only approximate.

The following figures are for the .45 Auto pistol with 230-grain bullet:

Extrame range, 1,955 yards; height of trajectory, 2,219 feet.

Approximate trajectory for 25-yard range, 1 inch; for 50 yards, 3 inches, and for 75 yards, 5 inches.

Rapidity of fire—The pistol has been fired 21 times in 12 seconds, beginning with pistol empty and magazines loaded.

Velocity at muzzle, 802 f. s.; at 25 yards, 788 f. s.; at 50 yards, 773 f. s., and at 75 yards, 758 f. s. At present the government is not selling automatic pistols through the D. C. M.

WANTS AND FOR SALE

The uniformly excellent returns from advertisements appearing in the classified columns of Arms and The Man make it a most satisfactory and productive medium for the disposal of surplus shooting equipment, or the acquisition of special types of firearms.

Free Insertions. Each subscriber is entitled to one free insertion of one-half inch, when his subscription is paid up for one year. It is necessary only to write or print the text plainly, noting thereon the date subscription was paid. These advertisements will appear in the first available issue and should be in the publication office two weeks prior to the following publication date.

Paid Insertions. Non-subscribers or those who have already made use of the subscriber's privilege may take advantage of these columns at a cost of $1.00 per inch or part thereof. No advertisement for less than $1.00 accepted. Advertisements will be set in 6 point solid. They should be in the publication office two weeks prior to the time appearance is desired.

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

FOR SALE—Antique pistols, rifles, carbines, muskets, daggers, swords, powder horns, flasks, moulds, belt plates, curios. Lists free. Nagy, 33 South 18th St., Philadelphia, Pa.

FOR SALE—.22 Colt automatic, brand new; .22 Winchester automatic, first-class condition. F. Smith, 927 Grant Ave., New York City.

RESTOCKING—Springfield, Mausers, Krags, .22 Savage, N. R. A. and Newton rifles. Prices quoted upon request. Clarence H. Lyon, 610 East Main Street, Lansing, Michigan.

FOR SALE—Model 52 Winchester, complete, brand new, never fired, $40.00. Original Newton .256, open and peep sights, absolutely perfect inside and out, $45.00. 150 .256 cal. cartridges, special loaded by Sportsman's Service Station, $8.00 per hundred. Prices, F. O. B., Trenton; certified check, money order or draft on New York. H. D. Robbins, 1142 Hamilton Ave., Trenton, New Jersey.

FOR SALE—Lyman peep sight, mounted on cocking piece of Springfield '06, like new, $3.50; also an Ideal mold No. 308334, brand new, never used, $1.75. C. R. Jeffries, 137 Nevin St., Lancaster, Pa.

FOR SALE—Colts .44 W. C. F. New Service, 7½-inch; new barrel fitted at factory; cartridges and belt, $25.00. Sharps Borchard .45 cal., good, $5.00. I. Massey, Box 319, Geneva, Nebraska.

FOR SALE—Winchester Model 52, bluing worn, $30. Winchester A-5 scope, perfect condition, $25; both for $50.00. Remington .25 cal., slide action rifle, perfect condition, $30. C. Mason, 25 Winant Ave., Ridgefield Park, N. J.

WANTED—Bone or ivory handles for a .45 Colt, single action. State condition and lowest price. John M. Liptak, 765 Fifth Ave., New York.

FOR SALE—.22 cal. Niedner Springfield, shot 50 times, A-1 condition, military sights, also Mann-Niedner taper blocks, $27.00. S. A. Winchester scope with No. 2 mounts to fit Mann-Niedner taper mounts; sold only with above rifle, $30.00. .30-40 Winchester single shot rifle, no sights, Winchester scope blocks, cost $39.00, price $27.00. H. & A., 12 gauge single barrel, fair condition, $8.00. Remington double hammer, 12 gauge, shows hard use, $9.00. .38-40 Pope-Winchester, double set triggers, Scheutzen butt, extremely accurate, A-1 condition, extra .22 short No. 3 Winchester barrel, Pope take-down system, $55.00. .30 cal. Niedner-Springfield, military sights, specially chambered, reloading tool: about 100 shells, good shape, $32.00. Reason for selling, ill health. All guns carefully packed; f. o. b. Rowayton, Connecticut. J. A. Baker, Jr., Rowayton, Connecticut.

SPRINGFIELD RIFLES remodeled, or I can sell you a hand-made sporter stock for your pet Springfield rifle; guaranteed as first-class workmanship. Also open rear sights for No. 48 Lyman. Joseph Schober, 1605 Main Street, Fort Worth, Texas.

FOR SALE OR TRADE—Marlin .25-20 pump rifle take-down, one Remington .30-30 pump rifle, take-down; both rifles practically new and in crank condition, $30.00 each. Want .22 automatic Colt or Reising, or .22 target revolver. A. C. MacNulty, Republic, Washington.

FOR SALE—One Krag carbine with new barrel and stock, $25.00. .303 Ross, $5.00. 125 gr. .30 cal. Ideal bullet mould, $1.00. Double Modern Bond .45 cal. pistol mould, $2.00. Want .22 cal. Ballard rifle, also Winchester A-5 scope with mounts. R. D. Eaton, 1702 Maxwell Ave., Evansville, Indiana.

TRADE—New .45 S. & W. M-17 with ctgs, clips, holster. Want M-52 Win., or 6X B. & L. binoculars. C. K. Coble, 33 E. High St., Elizabethtown, Pa.

FOR SALE OR TRADE—Savage .22 N. R. A. stock, remodeled, open and aperature sights, condition perfect, $15. E. G. Stuart, 3 Kennywood Court, Youngstown, Ohio.

FOR SALE—Newton .30, fair shape; first money order for $35. Stevens No. 47 fine target rifle, .32-40, No. 3, 28-inch barrel, tapped for scope, extra barrel .33 Peterson and mould 32-inch No. 4 round, perfect inside; outfit $30.00. O. P. Stoner, Seeley Lake, Montana.

FOR SALE—One B. S. A. .22 cal. air rifle, adjustable peep sight, $25.00. One B. S. A. air rifle .177 cal., $15.00; both in perfect condition. W. R. Rothe, 413 Market St., Harrisburg, Pa.

WANTED—Colt .38 automatic, military model in good condition. Price must be reasonable. State your terms. Reid W. Bond, 14 Union Ave., Cratton, Pa.

FOR SALE—Colts, .38, O. M., 7½-inch, belt holster, $35. S. & W., .38, 6-inch, target sights, $30. Both fine; will consider Winchester shotguns in trade. A. H. Reupke, 2608 LeClaire St., Davenport, Iowa.

FOR SALE OR EXCHANGE—.30-40 Winchester S. S., double settrigger, special high-power firing pin, Winchester scope bases, Ideal tools, 2 moulds, shells, sights, etc., $25.00. U. S. Rifle, Model 1917, $18.50. Model 404 (not 414) Stevens .22 L. R., exceptionally accurate and just the thing for N. R. A. matches, $22.50. Mauser 8 mm. military, 24-inch, apparently never fired, partly remodeled, $12.50. Remington-Hepburn match rifle, .32-40, $15.00. Flying lock Remington match rifle, 44 special and shells, $15. Remington sporting rifle, double set trigger, $10.00. Billinghurst muzzleloading target rifle, telescope sight, peep, tube and open lights, tools, etc., $25. Winchester S. S. musket, .22 short, needs new barrel, $6.00. Two double set trigger Ballard action, C. F., need main springs, $4.00 each. Winchester tools .44 S. & W. Russ., $2.00. Winchester tools .25-20 S. S., $2.00. Winchester mould .32-40-165, Ideal moulds 403169, 429215, each $1.00. Shell resizing die 45/70, $1.00. 1-A Graflex, Cooke F 4/5 lens, like new, cost $155.00, make offer. Want high-grade double 12 ejector, Parker preferred, .45 Colt Bisley target or .45 Colt New Service target revolver, .45 S. & W., 1917. Above offers are good value. Will give or take difference in cash. Address Capt. Fred V. Berger, Fort Sam Houston, Texas.

FOR SALE—16 ga. L. C. Smith hammerless shotgun, perfect. Set .45-70 and set .23-20 Winchester loading tools. 1 .32-40 Pope mould. All in good order. Would buy 20 ga. shotgun, if cheap. F. J. Korges, Victoria, Texas.

FOR SALE—Springfield sporter, 26-inch super-accurate Niedner barrel, Griffin stock, 14x1⅞x3. Lyman 48 rear; absolutely new, $125.00. T. D. Sloan, Chevy Chase, Maryland.

WANTED—.44 S. & W. Special, 7½-inch target, dove-tail blocks for Stevens scope; .30-'06 barrel for Winchester S. S. Must be perfect, and Winchester or Stevens scope. D. Schemnitz, 765 Shaw St., Toronto, Ont., Canada.

FOR SALE—Krag sporter, absolutely brand new and perfect; nicely carved and checkered forearm and pistol-grip stock, sling swivels, Lyman No. 34 rear and Ivory bead front sight; also cartridge belt and cleaning rod, $35.00 cash. Jos. R. Kleinguenther, 2062 E. Clementine St., Philadelphia, Pennsylvania.

FOR SALE—Springfield .30-'06, specially selected at Arsenal, pre-war, as issued, perfect and accurate; fired less than 300 shots, $30.00. Can furnish 200 cleaned and primed shells and Ideal loading tools for $5.00. Satisfaction guaranteed. Ira W. Enos, 732 Lafayette Ave., S. E., Grand Rapids, Michigan.

NOW *you can get real "punch" with your 30-30 rifle*

Use the US Improved Thirty-Thirty Cartridge. Thirteen per cent more striking energy with no increase in cost. Longer range, lower trajectory, quicker mushrooming.

Has 170-grain bullet, 2125 feet per second muzzle velocity, 1707 foot-pounds striking energy. Your dealer has it or can get it. Descriptive circular on request.

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IMPROVED US *Thirty-Thirty*

AGAIN—

REMINGTON UMC

British Rifle Shooters Win With Remington .22 PALMA Cartridges

This time it happened at the S. M. R. C. Scottish Meeting at Perth on June 14th to 17th, 1922.

The following first prizes were won by shooters using Remington .22 PALMA Cartridges.

B. S. A. Competition

Vickers Competition

Nobel Dominion Challenge Cup

The Edinburgh Civil Service Rifle Club Team won the Pullar Challenge Target with a **record** score of 786 out of 800, and the Dewar Challenge Cup with a score of 774. All the members of the team used Remington PALMA 22's.

Many other prizes were won with Remington PALMA .22's.

At the S. M. R. C. London Meeting held at Ham and Petersham Rifle Range, May 12th to 17th, 1922, shooters using Remington .22 PALMAS swept the boards. See our advertisement in August 15th issue for details.

Shoot Remington .22 PALMAS to win.

Remington