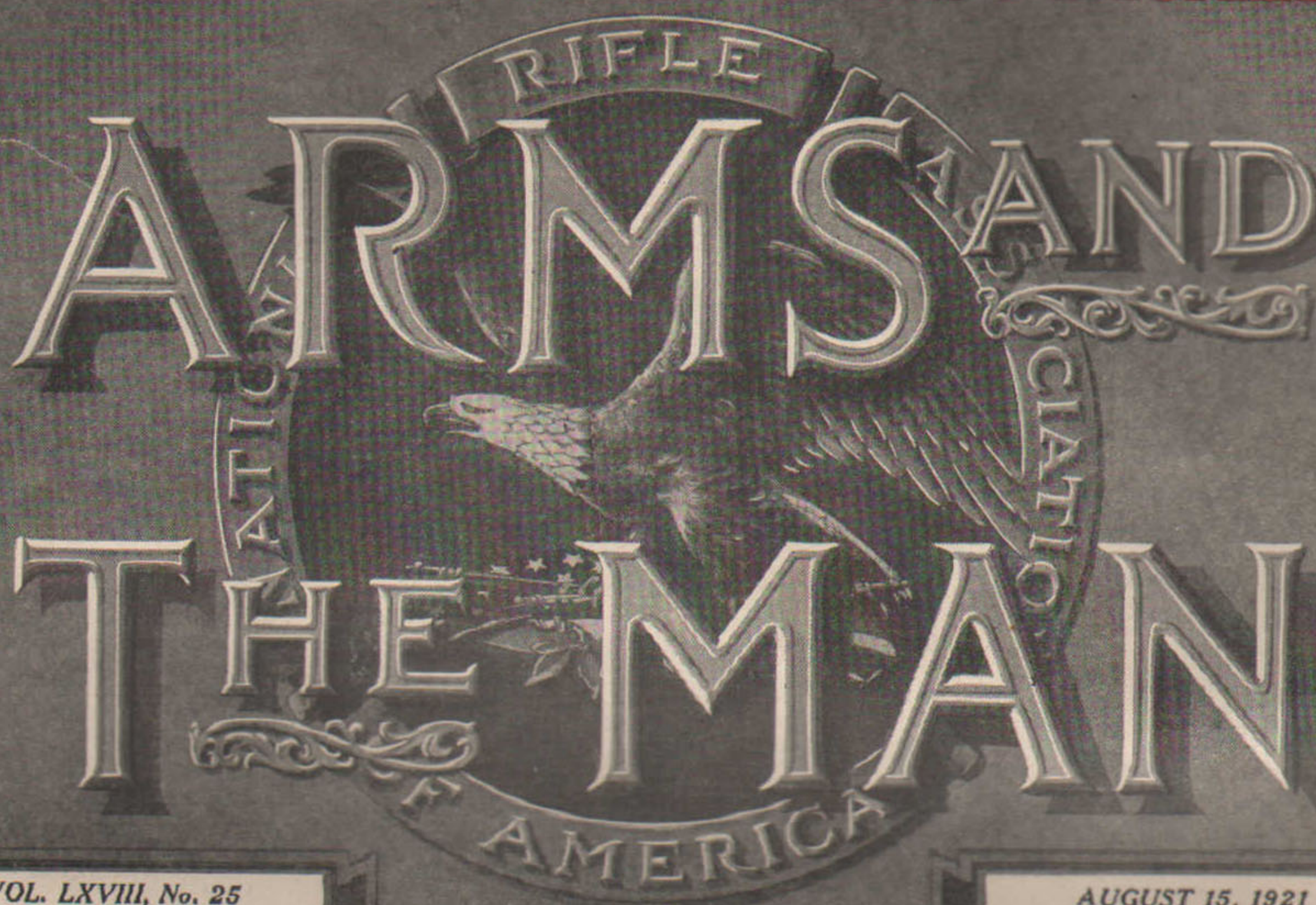


# THE AMERICAN RIFLEMAN'S MAGAZINE



VOL. LXVIII, No. 25

AUGUST 15, 1921

## Americans Win Free Rifle Match at International Meeting

THIS cablegram has been received as Arms and The Man goes to press from the team representing the United States in the International Matches which began at Lyons, France, August 4:

Lyons, France, Aug. 12.

General Fred Phillips,

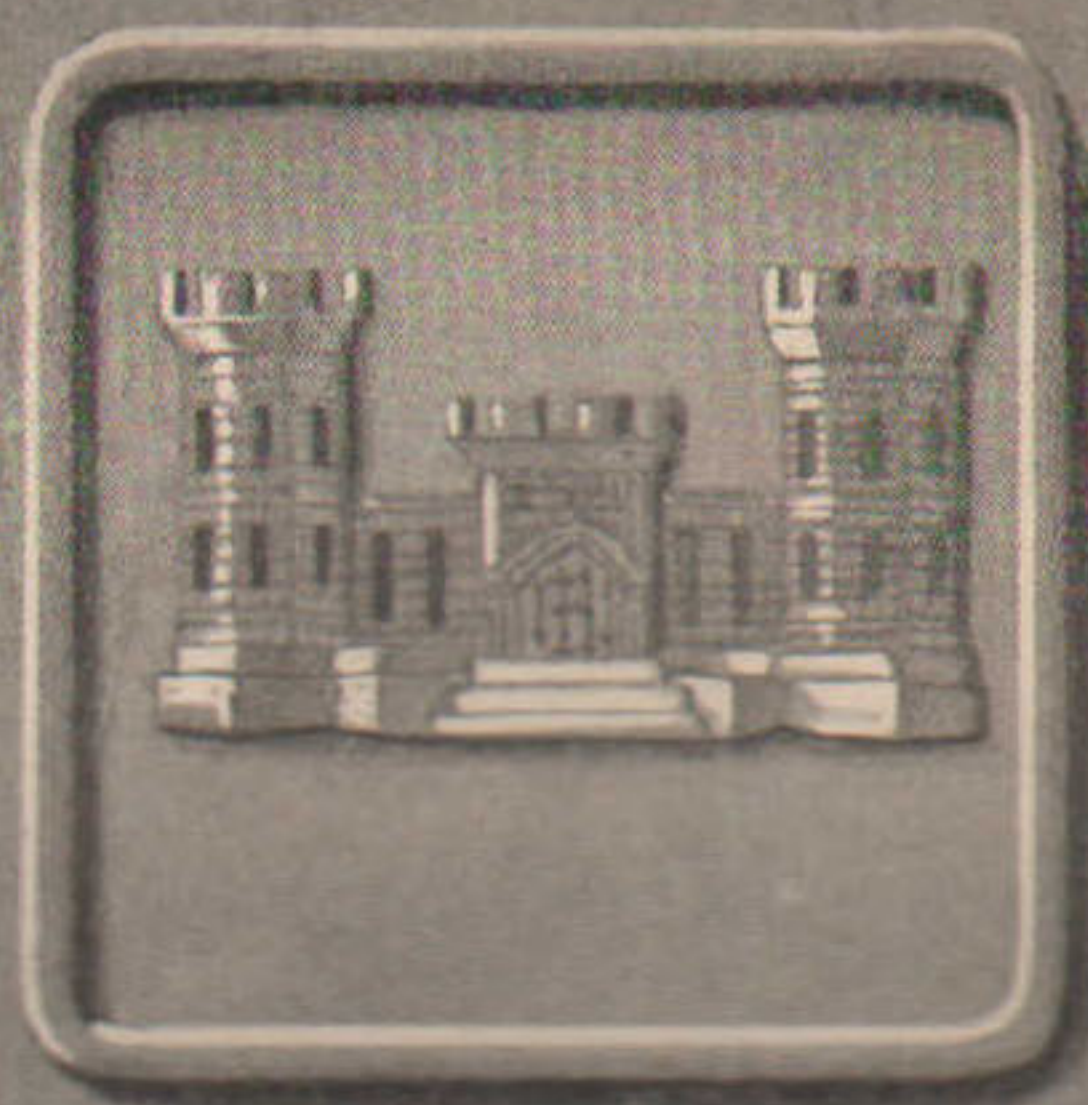
National Rifle Association, Washington, D. C.

United States won Free Rifle Match, score 5015, Switzerland 4931, France 4608, Italy 4581, Holland 4249. Stokes, our team, won Individual Championship, 1056, and first place in standing, kneeling and prone events, Free Rifle. Pistol Team Match won by Italy.

Snyder.

Additional information received shows that in winning the Individual Match, Stokes tied the score made by Rene of France in 1914 at Viborg. The record is 1078 made by Staheli of Switzerland at Baritz in 1912. The Swiss, upon their return to Berne are reported to have stated that this is the first defeat they have suffered in 15 years, and that the defeat this time was due to "special technical equipment" in the hands of the Americans. They are quoted as saying that they will not enter any other international matches unless such equipment is barred.

The scores in the Pistol events, as reported, are: Italy 2470, Switzerland 2465, France 2464, United States 2310. Individual Match: Hanns, Switzerland, first; Sorrani, Italy, second, and Thomas, United States, third.



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 Powder Makers to the  
 United States Government



# ARMS AND THE MAN

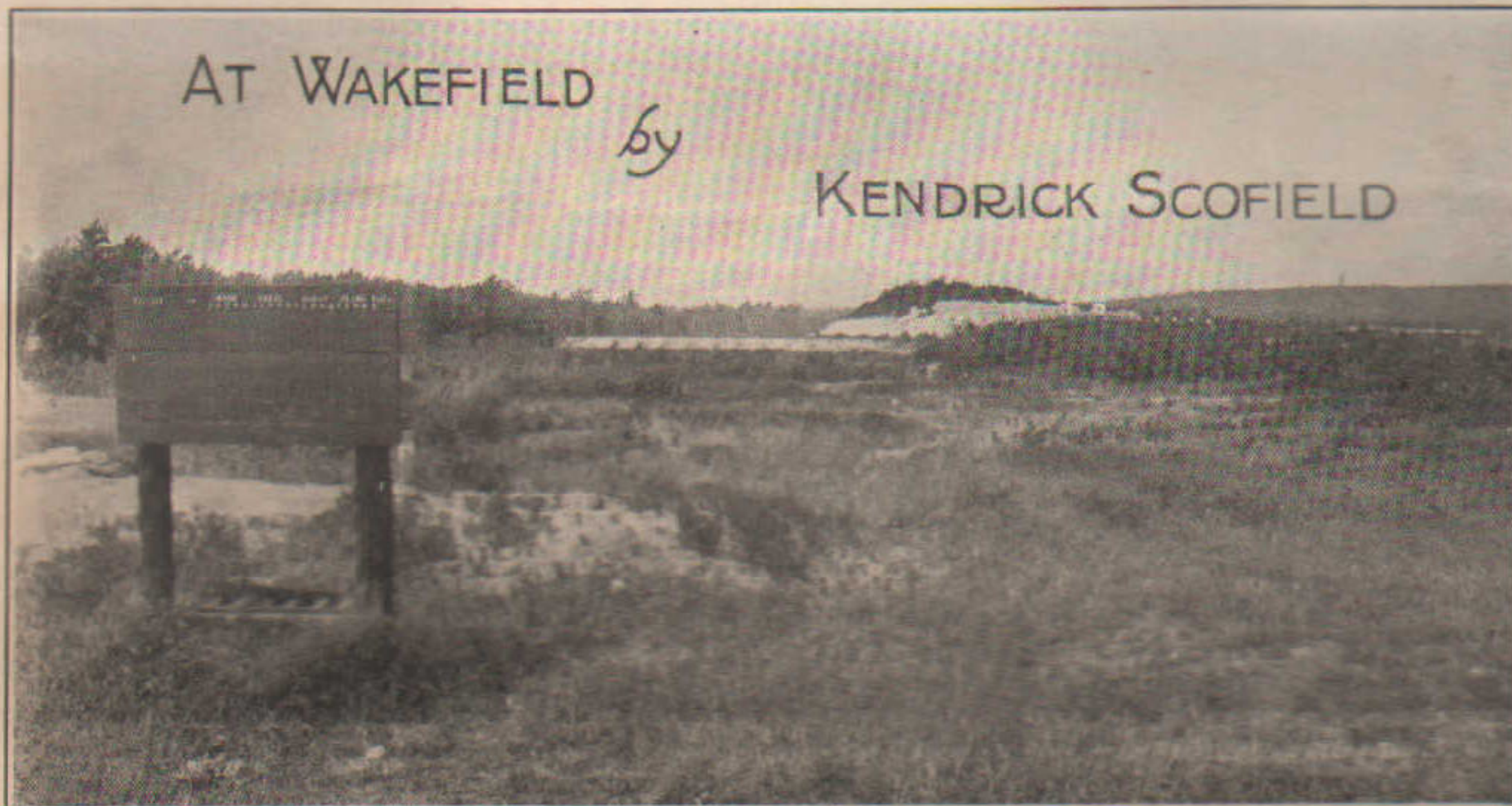


The Official Organ of the National Rifle Association of America

Volume LXVIII, No. 25

WASHINGTON, D. C., August 15, 1921

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**W**AKEFIELD—the range which in the minds of riflemen is associated with Perry Schofield's run of 116 bull's-eyes at 500 yards, with Stuart Wise's run of 105 at 800 and many other remarkable feats of marksmanship—has been again the scene of phenomenal shooting.

During the tournament of the United Services of New England, which closed August 13, Sergeant Thomas J. Jones, U. S. M. C., drove 133 bullets into the new 10-inch bull's-eye at 300 yards, G. L. Cutting of the Worcester, Massachusetts, Rifle and Pistol Club, pushing Jones hard for first honors, piled up 100 straight before his string was broken by a Four, and just to show what can be done at rapid fire, Captain "Joe" Jackson, the veteran Leatherneck, scored 80

straight Fives before he "got tired" of working the service bolt and quit while still in the black.

This is the big news of the Wakefield matches. There were many other closely contested events, however, including such matches as the Hayden and Marine Corps Long Range events, to keep the hundred-odd contestants interested through the four days of competition. The second half of the United Services Fall Tournament—designed especially to appeal to other than the veteran service shots, most of whom at that time will be at the National Matches—will be held from September 21 to 24, when such events as the Bancroft, the Massachusetts National Guard Association, and other service rifle events will be shot, together with an attractive small-bore program.

At Wakefield this year, riflemen also had their first opportunity to observe the behavior of Franford Arsenal's new "Tin Can" ammunition, an improved type of which will be issued at the National Matches. The "hundred-and-seventy" unquestionably is by far the most accurate ammunition ever turned out by the government. It is a good wind-rider. But the man who lubricates one of those tinned bullets, or who attempts to fire it in a rifle which carries even the slightest film of grease in the chamber or the bolt, does so at the risk of serious injury, and the demolition of his gun. Of this, more later.

For the benefit of those who have never faced the targets on the Bay State Range, be it known that Wakefield lies easily accessible some twelve or fifteen miles north of Boston. The reservation, established in 1904, covers about 450 acres, the axis of which runs almost due north; a fan-shaped tract with the handle of the fan crossed by a firing line common to all ranges, with butts in echelon at all distances occupying the tract where it widens before it is again crossed some 1,800 yards from the firing points by a range of broken hills which form a natural backstop. Behind these hills lies other range territory, and up to the northern boundary of the range comes the mucky fringes of Great Cedar Swamp. So even in the thickly settled country about Wakefield, there is little danger of even service bullets doing any damage to life or property. Behind the firing line, the executive offices and the permanent barracks erected while



When the long runs were made: Left, Jones as he fired his 130th shot for record; Center, the victor inspecting the score board; Right, Cutting, who ran a century, firing his 100th shot



Some of the men who made the Wakefield matches a success. Front row left to right: 1st Lieut. J. McK. Driscoll, Mass. N. G., Asst. Statistical Officer, Maj. A. G. Reynolds, Mass. N. G., Statistical Officer, Lieut. Col. F. W. Stopford, Coast Artillery, U. S. A., Maj. J. M. Portal, and Maj. J. J. Dooley, Chief Range Officer. Back row, left to right: Capt. Jos. Mulloy, Boston, Maj. L. W. T. Waller, Jr., Executive Officer, and Capt. Thomas B. Doe, of Lowell.

the Navy controlled the range during the war are located.

Almost since the time nearly twenty years ago when Major John M. Portal and other Massachusetts riflemen established the Bay State Range, service teams have used it, and it has become known as one of the most sporting ranges in the country—especially the 1,000-yard range, which, bisected here and there with many guts and gullies, is constantly the playground of the trickiest of air currents. The entire range occupies a wide alley cut through a heavy second growth of pines which occasionally shelters the range, but which more often guides the wind into devious and troublesome ways, hard to guess and even harder to scientifically “dope.”

On this range, Monday, August 10, there gathered a small and select aggregation of shots from the Marine Corps and Coast Artillery National Match team squads who have been “trying out” at Wakefield, with a sprinkling of Massachusetts National Guardsmen and civilian riflemen. At the request of the executive committee of the United Services, Major L. W. T. Waller, Jr., U. S. M. C., was in charge of the matches as Executive Officer, with Major John J. Dooley, U. S. M. C. R., as his Chief Range Officer, and Major A. G. Reynolds of Massachusetts as Statistical Officer. Two officers of the United States Coast Artillery, who were in Massachusetts on leave, Lt. Col. H. B. Grant and Lt. Col.

F. W. Stopford, volunteered their services and aided in running the ranges.

The Bailey Match—10 shots rapid fire, 200 yards, kneeling or sitting from standing—opened the matches on August 10, and attracted 90 entries. Of these, 30 scored possibles, and after six shoot-offs, 6 of the contestants were still in the black. It was then agreed among the six that the seventh shoot-off would be on the 8-inch A target instead of the standard rapid-fire card, and two attempts at settling the match in this manner did not result in the elimination of surplus ties, two Marines still claiming first honors. Just how this tie was settled between the two Leathernecks is not definitely known. They didn’t shoot it off—at least not with service rifles. Anyway, Marine Gunner Otho Wiggs was officially declared winner of the event on a perfect score.

Ninety-nine entries showed up for the McKenzie Match—2 sighters and 10 shots for record prone at 600 yards—following the Bailey Match. Private G. M. Jeffs of the Massachusetts National Guard, got into the bull on his first record shot and remained there for his full 10 shots and four additional, winning over Corporal L. D. Wilson of the Marines, who had 50 plus 1, and Sergeant T. J. Jones, who was later to distinguish himself, and Sergeant E. S. Stake, each of whom ran a possible.

The Bancroft Match was scheduled for the afternoon, but when it was about time to commence firing it was discovered that only one team on the ground could qualify under the conditions prescribed. Therefore,

in place of the Bancroft, a special team match calling for an off-hand stage at 200 yards and a prone stage at 600 yards, was substituted. This drew nine entries. At the close of the 200-yard shooting, the Coast Artillery team was pressing the Marines closely, but at the longer range, both the first and second Marine Corps teams ran up totals that put the Artillerymen out of the running.

The second day of the tournament was devoted exclusively to the Hayden Match with special entries for the New England Interstate Match shooting simultaneously. The conditions of both these matches are identical with those of the National Match course, with no sighters at any range. The trophy in the Hayden Match is a magnificent bronze statuette, “The First American Marksman,” presented by Col. Charles Hayden, late Paymaster General of Massachusetts. The New England Interstate Match carries with it the trophy donated for this purpose by the New England States.

Seventeen teams entered for the Hayden and Interstate honors, and began shooting early on Thursday morning, August 11. The light was fair, but during the off-hand stage there was just enough of a puffy wind from 4 o’clock to disconcert all but the old timers. Later the wind shifted to 6 o’clock and steadied down, blanketed largely by a grove of trees behind the firing line; but this came too late to do much good. The Marine Corps second team was high on a score of 437 when the contestants started rapid fire, but the First Leathernecks closed the gap by a higher score from the sitting position and kept putting on points above all rivals through the 300- and 600-yard stages.

During the afternoon when the long range stage was fired, the 1,000-yard sweep at Wakefield lived up to its evil reputation and the wind wobbled, veered and changed to the dismay of many of the contestants. The mirage was very thin—so thin that trained wind observers had difficulty in reading the dope. This and the conditions which prohibited sighters made the going hard, especially when the light began to change with the oncoming of clouds presaging rain for the big day of the shoot which was coming.

In spite of the hard conditions, the members of the First team of the Marine Corps piled up 889 points at 1,000—7 points better than the total of the Coast Artillery Corps First Team, hanging on the trail of the Leathernecks in a last hour effort to recoup points lost at the shorter and easier ranges, and were declared winners of the Hayden All-America Trophy. The Massachusetts National Guard Team No. 1 took the New England Interstate Match.

The story of the shoot on August 12, during which the phenomenal long runs were made, properly begins on the night before when a group of Marines were peer-

ing in through the window of the Statistical Office, where the trophies for the shoot were on display. One of the Marines listened while a clock in a case of shining mahogany and brass, chimed the hour.

"I sure aim to win that clock," he said. "It just suits me."

And the next morning, that Marine—Sergeant Thomas J. Jones, with a permanent station at San Diego, but temporarily attached to the Marine Corps squad—was among the first to gather on the firing line for the Campbell Match, 2 sighters and 10 shots prone at 300 yards, in which the clock was first prize.

Conditions did not look propitious for high scores. A bothersome drizzle was falling, and at first the light was not any too good. The Match—insofar as the possibilities for record-breaking scores was concerned—was a relatively unimportant one. That fact, and the rainfall accounted for the small gallery. Jones also was practically an "unknown," a promising young shot, but not regarded as being in the same class with the Marine Corps veterans.

As it chanced, when Jones lay down to shoot, he trained his sights on a practically new target, only two men having preceded him. He let off his first sighting shot—a four—at about 9:25 a. m., and put his second sighter into the center of the bull. Then he proceeded to run 10 straight, and continued to shoot. About the time Jones had fired his fifteenth shot, on Number 4 target, G. L. Cutting, a civilian, from Worcester, lay down at Target 10 and began firing, running a possible and continuing.

The word passed quickly down the firing line that a Marine had made a good start for a high score and that a civilian was giving him a good run for his money. Wherefore, by twos and threes from all



The Wakefield trophies proved attractive to the assembled riflemen.

over the range, a gallery soon collected. Shot after shot went down the range from the two marksmen, and while they piled up bull after bull all other entrants finished their scores, and dropped out, joining the gallery, until only Jones and Cutting occupied the firing line.

After a little, the shots began to come from the two men alternately as if they were shooting as a pair, Jones appearing to listen for the report of his rival's rifle each time before he shot again, and after each shot, dropping his head forward on his arms until called back to action by the crack of Cutting's gun.

When Cutting started running his score above the possible, Jones had a lead of

some 18 or 20 shots; then he began to fire more rapidly increasing his lead. Steadily for minute after minute until the time grew into hours, Jones and Cutting kept shooting in a dull gray light, sending their 180-grain bullets over a range untroubled, for the time, by wind. About the middle of Jones' string, the markers in the pit found it necessary to paste a new center over the target, the bull's-eye of the original paper having literally been shot away in the center, leaving a jagged hole about 5 inches wide by 4 inches high. During Jones' shooting, four spotters were shot up so badly as to be of no further use, and after the string, the fifth spotter showed five or six bullet holes.

Down on Number 10 target, shooting left-handed, and consequently facing toward Jones, Cutting was making, if anything, a closer group than Jones, steadily climbing toward the hundred mark which Jones had already passed. Then as the light grew brighter, the scorer for Cutting was heard to call: "Mr. Cutting's 101st shot for record—a four," and the Massachusetts civilian was out of the race after having hung up a remarkable total.

When Cutting went out, Jones had just fired his 129th record shot. Three times more he fired, and each time the marker gave him a five, and then on his 133d shot, he went out for a close four. He had hung up a total of 132 record bull's eyes and 133 consecutive bull's-eyes.

The coveted clock was unquestionably his.

Jones' performance is probably a record for consecutive bull's-eyes. It is certainly a record for 300 yards on the new 10-inch target, and the strange part of it is that when the target was brought from the pit, after the match, examination of it showed that very few of his shots would have gone outside the 8-inch ring of the old "A" tar-



The range buildings are clustered directly back of the firing line.

get. Also, there were very few shots which came dangerously near the line. It is likely that the young Marine would have added further to his phenomenal performance if it had not been for the rain which washed the black off of one side of his front sight and bothered him considerably during the last few shots.

Naturally, every rifleman who had a camera with him wanted to snap Jones' picture, and they lined him up against the score board where the young Marine stood gazing at the monotonously long string of fives.

"Turn your head this way," somebody called.

"I just can't take my eyes off that four," Jones drawled, as he turned and the cameras snapped.

The Ratigan Match, 2 sighters and 10 shots off-hand at 200 yards, also fired Friday morning, drew 75 entries and was won on a total of 47 out of 50 by Marine Gunner J. J. Farragher, who outranked Maj. W. D. Frazer of the Coast Artillery and Lieutenant Whaling and Captain Ashurst of the Marine Corps, with similar totals.

On Friday afternoon, the Marine Corps Long Range Trophy Match at 600 and 1,000 yards—two-man teams, 2 sighters and 10 shots prone at each distance, for a trophy presented by the Boston Leathernecks—was staged with about 70 entries. The rain of the morning cleared and the sun shone brightly. One of the first pairs up—Sergeants Porter and Liell of the Marines—put on a total of 98 at 600 and were the second pair to shoot at 1,000, where they finished with four points down. Their score of 196 for the match was not topped, in spite of the fact that some later entries went to the long range with perfect scores, the changing light and a wind which started to blow from 7 o'clock but settled to a 9 o'clock, puffy current proving the undoing of most at the greater distance.

The Phelan Match, 300 yards rapid fire, the Cummings Match at 500 yards rapid fire, the Pfaff Match at 1,000 yards, the First Corps Cadets and the Ninth Regiment Matches closed the Wakefield program on Saturday afternoon. It was during the Phelan Competition that Capt. "Joe" Jackson ran eighty consecutive bull's-eyes at 300 yards rapid fire, stopping while still in because his lead was not threatened and because he said he was "tired working the bolt."

Both the 180-grain match ammunition of standard factory loading and the new Frankford tinned bullet match load figured extensively in the Wakefield Matches, with the majority of entrants in the matches and practically all of the team squads using the government cartridge. Wherefore, considering that the Marines and the Coast Artillerymen have for several weeks, day in and day out, been working with the new National Match ammunition, it is but natural that the Wakefield matches was one

of the best of sources for information as to how the new cartridge behaves with the service rifle.

On the testimony of scores of experienced shooters, three facts stand out and cannot be casually disregarded. The first is that in accuracy the new product far excels any ammunition of government manufacture which has so far been produced, and for shooting up to 600 yards compares favorably in wind-riding qualities with the factory 180. At 1,000 yards, however, when there is more than a  $\frac{3}{4}$ -point wind blowing, the superior wind-jamming qualities of the 180, veteran shots declare, are quite apparent.

The second outstanding fact is that although the tinned bullet was designed to eliminate metal fouling, the bores of rifles through which the Frankford 170-grain load has been fired not only take on a light deposit of tin, but collect bumpy deposits very similar to those encountered in a barrel fouled with cupro-nickel, and which when treated with ammonia dope, give the old familiar blue reaction.

The third, and by far the most important fact, is that in the new Frankford Arsenal load, the limit of safety seems to have been very nearly reached whenever the bullet is lubricated or whenever there is the slightest oil in or about the chamber or bolt, and the only safe way to shoot it is not only to shoot all bullets dry but to see that chamber and bolt are also dry—even if cleaning them with gasoline has to be resorted to—before firing.

Frankford Arsenal deserves credit for the development of a load which is as accurate as the 170-grain "Tin Can" has proved to be, and the ammunition issued at the National Matches will differ from that first produced and given to the service teams for tryouts both in the matter of crimping the primers more tightly and in using a harder case metal. Nevertheless, there is no good end to be served in blinking the fact that every care must be used in firing this ammunition to keep its pressures within the safety limit. Both deliberate tests and observation from the actual use of this ammunition at Wakefield has proved to the satisfaction of more than a hundred experienced marksmen that a single drop of oil, boiling out of the bolt, when the rifle heats up, may lead to at least a blown out primer, if nothing worse; and the four or five rifles which have burst on the firing line, because of greased chambers, and which caused more or less serious injury to two men, have given ample actual evidence of the danger which lurks in a round of this ammunition coupled with a drop of grease.

The riflemen at Wakefield also have found the problem of cleaning the fouling which is resulting from the 170-grain bullet not nearly so simple as first expected. The tin deposit on the bore which follows the use of this ammunition, naturally does

not respond to recognized solvents. So long as the deposit does not become lumpy, it seems to give way before energetic scratch-brushing. When it is of the lumpy variety, it partially succumbs to ammonia dope, giving the blue reaction, which leads those who have encountered it to believe that when the tin deposit becomes lumpy, the lumps scratch through the tin plating on the bullet jacket, and accumulate cupro-nickel underneath from the underlying jacket.

In scratch brushing it has also been found that the .30 calibre brush not only is largely ineffective, but lasts only a short time; the best results have been gotten from using brass brushes from .32 to .38 calibre.

Another circumstance which is reported by the riflemen at Wakefield is that normal elevations appear to rise on rifles wherein the new ammunition has been very considerably used. That is to say, for instance, if a given rifle was found to require 36 minutes elevation for a given range when the new load was first used, the elevation for the same range a week or two later after constant shooting might be 41 or 42 minutes—suggesting at least, that some circumstance connected with the use of this ammunition has made the rifle normally shoot lower.

It is to be hoped that the changes which Frankford has already made in the new National Match load will materially check whatever tendency it may have toward rapidly rising and dangerous pressures, but the fact remains that the experience of the Marines and Coast Artillerymen with this load at Wakefield has shown just how much there is yet to be learned of it when used under actual match conditions and in the general run of rifles.

The scores of the different events at Wakefield include:

#### THE UNITED SERVICES OF NEW ENGLAND.

##### No. 1. The Captain Ratigan Match.

75 Entries—11 Prizes.

1. Mach. Gun. John J. Farragher, U. S. M. C.....	47
2. Maj. W. D. Frazer, C. A. C.....	47
3. 1st Lt. William J. Whaling, U. S. M. C.....	47
4. Capt. William W. Ashurst, U. S. M. C.....	47
5. Sgt. Albert F. Frederick, U. S. M. C.	46
6. Sgt. O. S. Hahn, C. A. C.....	46
7. Sgt. Earl B. Porter.....	46
8. Capt. Joseph T. Lawless, M. N. G.	45
9. Pvt. A V Harrington, M. N. G....	45
10. Pvt F. H. Keen, M. N. G.....	45
11. Gy. Sgt. E. L. Rush, U. S. M. C....	45

##### No. 2. The Bailey Match.

90 Entries—13 Prizes.

1. Marine Gunner O. Wiggs, U. S. M. C.....	50
2. Sgt. T. J. Jones, U. S. M. C.....	50

(Continued on page 15)

# Frankford Condemns Grease

BY STEPHEN TRASK

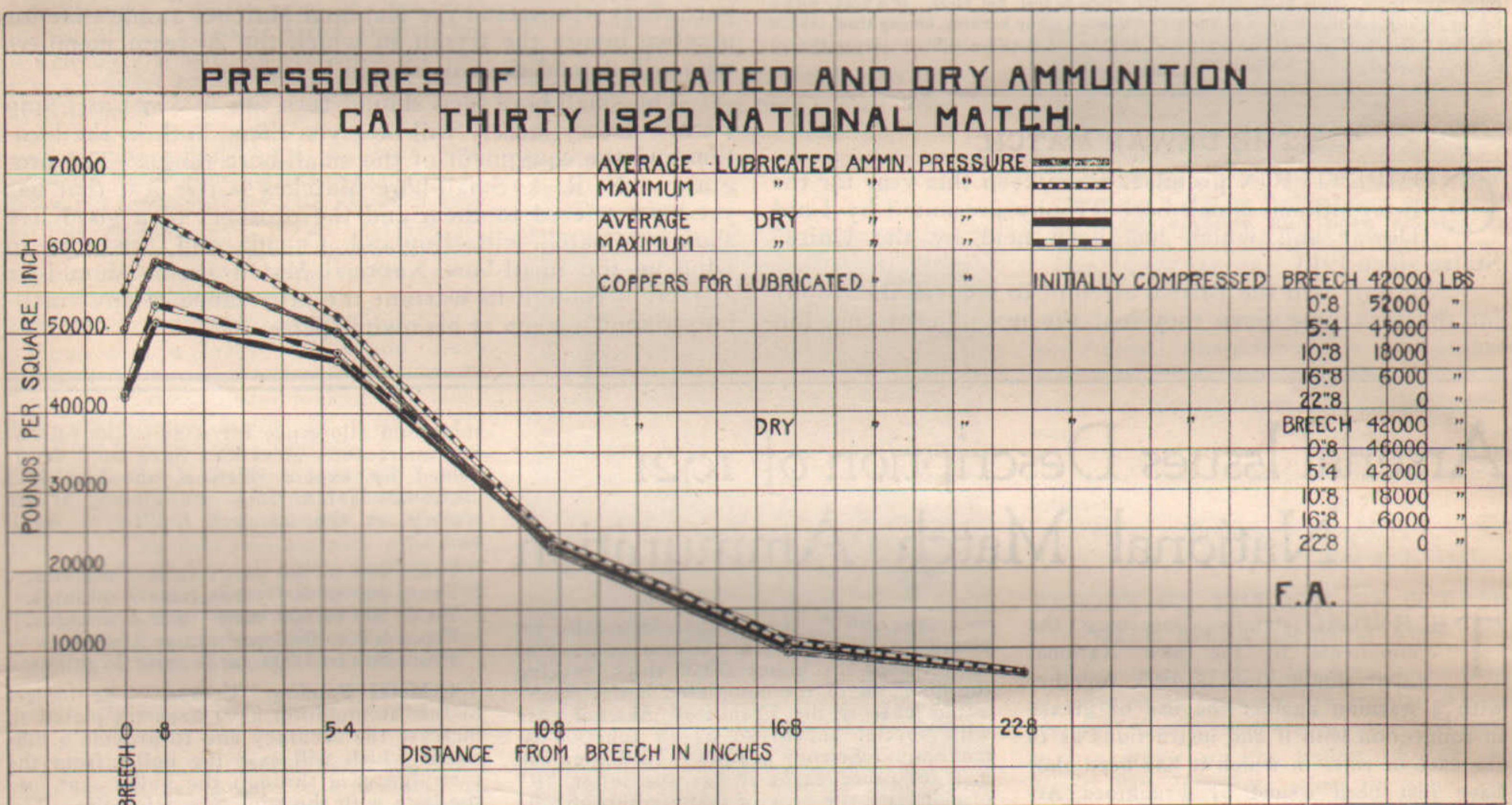
FROM the pressure guns at Frankford Arsenal has come an array of facts and figures which seem to be the final words in the much-mooted question: "Grease or No Grease."

That the use of lubricant on high-power bullets possesses no virtue in increasing velocities or in preventing metal fouling, but that it emphatically does run pressures up to and often past all margins of safety, has been conclusively proven to the satisfaction of the Ordnance Department investigators.

ent-day rifleman knows them, and not the old projectiles which carried grease-filled cannellures—was first accepted as good form some ten or twelve years ago, when the Army Rifle, Model of 1903, came into general use by all contestants in the National Matches. With the advent of the Model of 1903, the rifle men of the country promptly ran afoul of an excessive type of metal fouling very different, and exceedingly more troublesome than the type of fouling which forms in the rifle bores of today. Then the marksman could scarcely

cating bullets became a fixed and established habit among military—and ultimately civilian—marksmen surviving unimpeached for some five or six years more because of the psychological effect of its use rather than any real virtue it possessed.

About 1916, however, many rifle men of an investigative turn of mind began to look askance at the use of lubricants and suggested that the benefits accredited to this practice might be largely mythical, and that in fact the habit of greasing bullets was in all likelihood more harmful than otherwise. About this time there also began to eventuate marked improvement both in the making of government ammunition and the machining of the rifling, and the old type



The findings of the experts who conducted the experiments in the behavior of lubricated small arms projectiles will undoubtedly be accepted by most of the intelligent rifle men of the country. Here and there, however, one may still expect to find a few hard-boiled rifle men whose faith in the efficacy of grease will die hard. Yet with the findings of the Frankford Arsenal men before them, there would seem to be no further excuse for the rifle men of the nation to continue to risk blown bolts through the persistence in a practice which can in no wise make for increased accuracy.

Before the Arsenal delivers the final knock out to what it proves to be an old and familiar superstition, it might be time well spent to briefly cast back over the high lights in the history of grease as a bullet lubricant.

The use of greased bullets—as the pres-

fire more than 25 shots through a barrel without having it foul so badly as to seriously affect accuracy at all ranges above 600 yards. The rifle man of today, unless he be a survival from the ranks of the veterans, has no idea of the extent of this fouling. Instead of a patch here and there, the bore, from throat to muzzle, became a mass of lumps, which accumulated with such rapidity, that frequently in the middle of a string a shot would blow the bore clean.

About that time a superior grease known as Mobilubricant was put on the market, and thinking rifle men hit upon the plan of using this grease to decrease the fouling, to make for more consistent shooting and to make the barrel easier to clean. Like everything new and novel, the use of grease was also given credit for benefits which it did not exercise, and the custom of lubri-

of metal fouling began to give way to a less troublesome form.

Then came the increase in the weight of the standard match bullets, at the same time maintaining the standard velocity of the older model cartridges of 2,700 foot seconds, and with this increase in ballistic qualities came also accidents following the use of grease in excessive quantities, by shooters who have persisted in following this practice.

A number of intelligent rifle men who refuse generally to take statements on faith, and who wish to correlate effect with cause wherever possible, set about running down the truth of the grease question, especially when bolts began letting go under conditions which more than suggested that over lubrication was responsible.

The results obtained by several of these  
(Continued on page 9.)

# ARMS AND THE MAN

1111 WOODWARD BUILDING, WASHINGTON, D. C.  
SEMI-MONTHLY—ON THE 1st AND 15th DAY

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

Associate Editor  
KENDRICK SCOFIELD

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

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

## THE DEWAR MATCH.

COMPETITION promises to be keen this year for the International Small-bore Trophy presented by Lord Dewar and which has been held by the United States since 1913.

Not only will the British attempt to recover the trophy for the fifth time since they lost the magnificent cup, but

Canada and Australia are expected to enter teams, and the skill of the Colonials must not be underrated. The Australians and the Canadians have always been keen shots, and the marksmen of those countries have, since the war, gone back to the shooting game with renewed zest. There is also another side to the question: The small-bore riflemen of Great Britain, who, from all reports during the past two Dewar Matches, fired against the United States without any previous practice as a team, are, according to word received from England, working as a team unit this year, a fact which may make considerable difference in the total to be expected from them.

Therefore, winning the Dewar this year will be a much greater honor to the victors than in the five years immediately past. To retain the big silver cup in the United States, it is not unlikely that the American small-bore shots will be called upon to put forth the best they have. The International Small-bore Match will in all probability be shot this year on September 18, which will give all small-bore shots who attend the National Matches ample time for practice before the tryout in which the 20 team members who will defend the trophy will be selected.

The small-bore men should turn out in force at Camp Perry. Every facility will be given them, both in the location and the equipment of the small-bore range. The program of N. R. A. Small-bore Matches is the best that has yet been offered to them and the prospect of a good live shooting match with England, Canada and Australia to wind up the small-bore National Match season should be attraction enough to warrant the attendance of any small-bore rifleman, even at his own expense.

## Arsenal Issues Description of 1921 National Match Ammunition

TECHNICAL details concerning the components of the new National Match ammunition of 1921, together with a warning against the use of grease in connection with it and instructions as to the care of rifles in which it has been shot have just been issued by Frankford Arsenal. Copies of these instructions will be distributed at the National Matches and every team member should thoroughly familiarize himself with them. The full text of the instructions read:

1921 National Match Ammunition.  
Frankford Arsenal, Philadelphia, Pa.  
Office of the Commanding Officer.

1. The following information relative to 1921 National Match ammunition is furnished for the information, guidance, and assistance of all competitors at the National Matches.

2. **Description.** This ammunition, known as "1921 National Match Ammunition," is an experimental ammunition of the Caliber .30 Model 1906 type loaded at Frankford Arsenal for use in the National Matches of 1921. The bullet weighs 170 grains. The core is a composition of 30 parts of lead and 1 part of tin. The jacket is of cupro nickel. The base of the bullet is hollow, to prevent the lead core extruding and making the base untrue. The assembled bullet

measures .3079". It is then electrically tin plated so as to give a uniform coating of tin all over the bullet .0003" thick, making the diameter of the completed bullet .3085".

The case is the Frankford Arsenal case with special anneal so as to function at maximum efficiency in rifles. To distinguish it from other cases it has the letter "R" placed after the year of manufacture on the head. The primer is the Frankford Arsenal No. 70 primer. The powder charge is from 48.2 to 48.8 grains of DuPont EX-1076 nitrocellulose progressive burning powder.

The muzzle velocity of this ammunition is 2700 f. s. The breech pressure is 50,500 lbs. per sq. in.

The ammunition is packed in clips and bandoleers. Each bandoleer is given a number; this number being simply the order of manufacture. Unusual precautions have been taken so that all ammunition is exactly the same. The powder has been most carefully blended in the whole lot, the bullets most carefully selected, and the cases very carefully gauged. It is positively known that no choice exists as to any particular box of this ammunition. While the indiscriminate mixing of ammunition from a number of boxes might lead to a very slightly larger group on the target, the rifleman will be unable to notice any difference whatever in the firing of the ammunition from different bandoleers, no matter what the number of the bandoleer.

3. **Elevations.** The trajectory of this ammunition is very flat and it requires the

minimum allowance for wind. The following micrometer elevations have been determined by expert riflemen, shooting 1921 National Match rifles and aiming at six o'clock on the standard bull's-eyes A, B and C:

From 200 to 300 yards raise 2 minutes.  
From 300 to 500 yards raise 7 minutes.  
From 500 to 600 yards raise 5 minutes.  
From 600 to 800 yards raise 9 minutes.  
From 800 to 1,000 yards raise 13 minutes.

4. **Metal Fouling. Grease.** The bullets of this ammunition have been tin plated to increase the accuracy and to provide a lubricant which will ease the bullet from the cartridge case through the bullet seat into the bore with the minimum deformity. The tin plating also forms a most perfect lubricant during the passage of the bullet through the bore. Under the heat generated, the tin, which has a very low melting point, is to a certain extent volatilized. This lubrication prevents the deposit of any metal fouling from the cupro nickel jacket. The volatilization of the tin also prevents any accumulation of plating in the bore, so that the bore does not decrease in size as the rifle is fired. No metal fouling which can possibly interfere with accuracy will occur when this ammunition is used, and no precautions whatever need be taken as to the prevention or removal of metal fouling.

Competitors at the National Matches are particularly cautioned against the use of grease on the bullets. Grease will cause uneven velocities, and even when it is used carefully is liable to slightly decrease the accuracy. But, more important still, the use of grease with this ammunition is positively dangerous. Grease decreases the size of the chamber and available powder space, and runs the pressure up very high. In addition it allows the cartridge case to slide to the rear through the greased chamber more readily, and increases the back thrust



on the bolt head. Both the pressure and the velocity with this ammunition have been run up as high as is consistent with absolute safety. If grease be used the pressure will run up far above the safety limit, even running as high as 75,000 lbs. per sq. in. If grease should be used it is only a question of time when with these high pressures a case slightly softer than ordinary will be found which will open out and throw back and release the gas to the rear, completely demolishing the breech mechanism of the rifle and probably seriously injuring the firer. Therefore, under no circumstances should grease be used. Simply see that the cartridges have no dust or dirt on them before insertion in the bore of the rifle. Do not attempt to polish the bullets to remove the slightly frosted appearance. The ammunition shoots more accurately with these frosted bullets than when they are polished.

**5. Cleaning.** The cleaning of rifles after the use of 1921 National Match ammunition is extremely simple, by reason of the fact that no metal fouling is deposited. However, it has been found that in some cases the newer progressive burning powders tend to cake a little bit in the bore, this, however, only occurring occasionally. The following method of cleaning has been used at this Arsenal with perfect success for nine months with this ammunition. Rifles cleaned in this manner preserve their accuracy for the finest work for from two thousand to four thousand rounds.

First—Run a brass wire bristle brush through the bore for five or six strokes to loosen any caked metal fouling. A fairly new brass brush should be used. They wear out in about ten cleanings.

Second—Swab the bore thoroughly with flannel patches wet with Ordnance Rifle Cleaner, N. R. A. Rifle Cleaner, or Hudson solution. The first two are very much superior and will not only clean perfectly but will prevent rust almost indefinitely. The Hudson solution, the composition of which is well known, is superior to any other cleaning solution known, but is not such a good rust preventative. It however works excellently where the rifle is cleaned each day.

Third—Clean and polish the bore, using clean dry flannel patches on a cleaning rod. Usually five or six patches are sufficient for this purpose.

Fourth—Swab the bore thoroughly with a patch wet with Ordnance Rifle Cleaner, N. R. A. Rifle Cleaner, or any good gun grease or heavy oil.

It is advisable to clean the rifle as above before sundown of the day on which it was fired; that is, before the damp night air has saturated the primer and powder fouling.

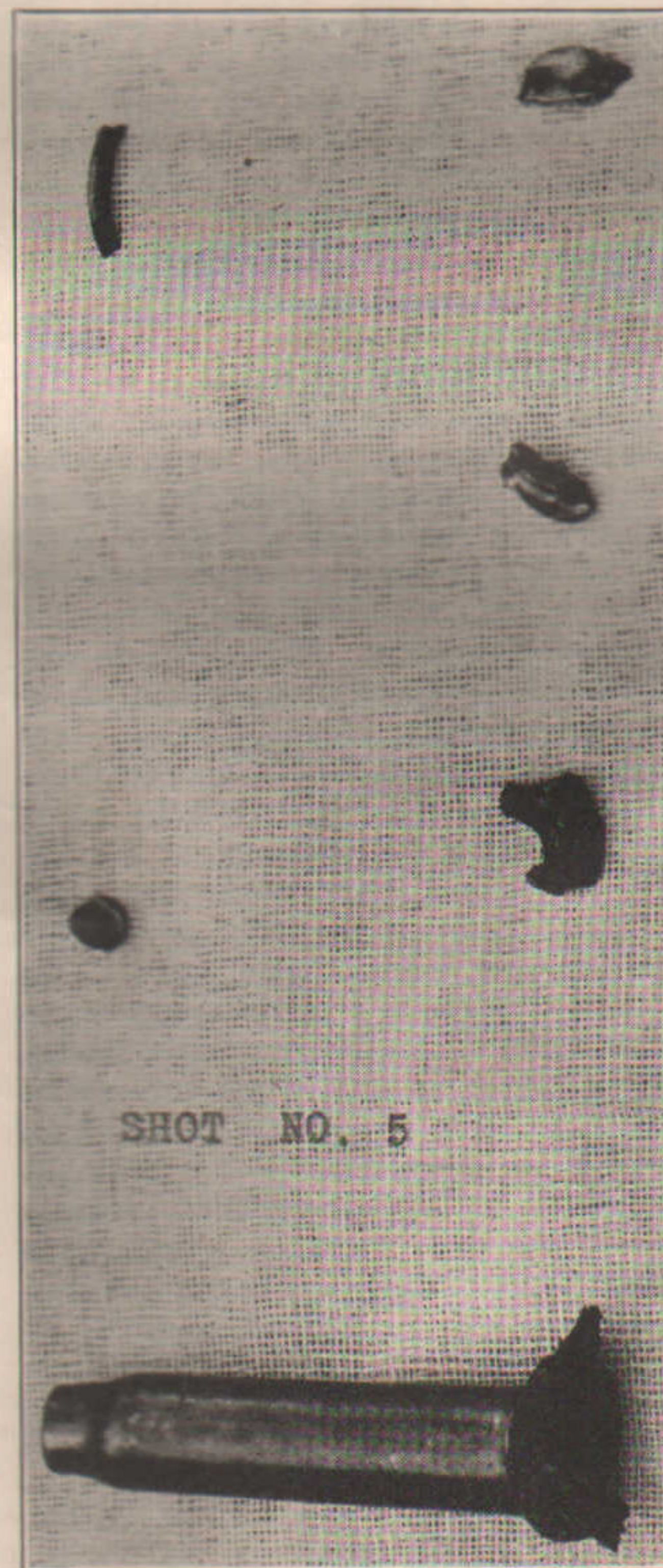
**6. Complaints.** It is requested that any defective ammunition or cases found be deposited in the box which will be provided for this purpose. In case of any unusual occurrence with this ammunition, it is requested that the competitor having the experience personally see one of the Ordnance Officers at the matches relative to it. It is not believed that any failures will occur with this ammunition, but if they do occur, the Ordnance Department desires to investigate them most fully, as every failure teaches us how to make better ammunition.

TOWNSEND WHELEN,  
Major, Ord. Dept., Comdg.

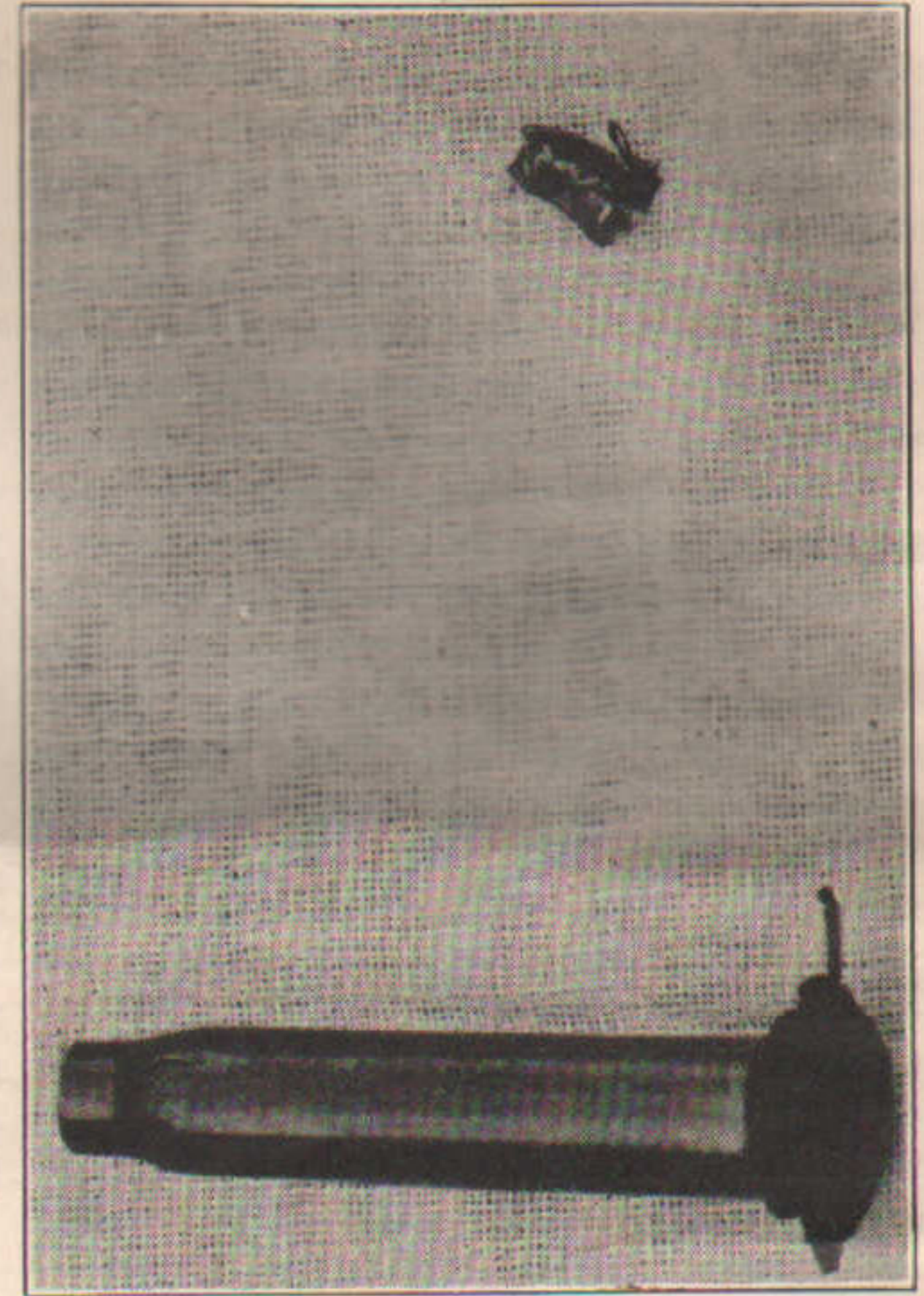
**FRANKFORD CONDEMNS GREASE**

(Continued from page 7.)

independent experimenters seemed to prove beyond all reasonable doubt that the use of grease on high-power ammunition is wrong and from it no practical benefits may be derived. The matter was then taken up by the Ordnance Department with the result that several months ago a series of exhaustive tests, planned to conclusively prove the pro or the con of the grease question were entered into. In undertaking to sift this mooted question, the Ordnance Department took into consideration what every rifleman must consider in deciding himself upon the use of lubricants: That the cartridge components of today give less metal fouling than those of the past, and that a more suitable metal for bullet casings has been found and that the powder has been materially improved, with the result that the fouling encountered today is only between ten and twenty per cent as troublesome as that encountered ten or twelve years ago.



Results of firing a Frankford Arsenal cartridge in a rear end pressure gauge; graphited auto cup grease allowed to accumulate. Actual pressure, 8,525 pounds.



Result of firing a Frankford Arsenal cartridge, 170-grain bullet, in DuPont rear end gauge in which vaseline had been allowed to accumulate in the chamber. Actual pressure, 10,620 pounds.

The report of the testing board at Frankford Arsenal, where the grease question has been sifted, and which is printed herewith, needs no amplification or further comment.

The full text of Major Whelan's report follows:

Frankford Arsenal, Pa.,  
June 28th, 1921.

**REPORT ON THE USE OF GREASE WITH RIFLE AMMUNITION.**

1. For many years it has been the custom of riflemen throughout the regular Army, National Guard, and also among civilians, to use grease on the bullets of Cal. .30 Model 1906 cartridges when the same are fired in the service rifle, in order to prevent metallic fouling and to make cleaning of the rifle easier. Many forms of grease have been used. The most prevalent form is the automobile cup grease, known as mobilubricant, made by the Vacuum Oil Company, of Rochester, N. Y. Other automobile cup greases are also used, as well as a mixture of Japan wax and Acheson graphite. In using this grease all of the bullet which projects beyond the cartridge case is given a thin coating of grease, and the cartridge is loaded into the chamber of the rifle in this condition. The following results are claimed by the advocates of grease:

- (a) The prevention of scales and lumps of metallic fouling.
- (b) Greater ease in cleaning the rifle; it being unnecessary to use ammonia for cleaning.
- (c) Increased accuracy life of the rifle barrel.

(d) Greater accuracy.

2. The use of grease as indicated above has become quite prevalent among all users of the service rifle. In fact, it may be stated that probably twenty-five per cent (25%) of the riflemen using this rifle and ammunition use grease on their bullets. It has been thought for some time that a certain amount of danger attended the use of grease. If the chamber of a barrel becomes filled with grease, it has been thought that the presence of the grease here would increase the density of loading by preventing expansion of the case to completely fill the chamber, and that the lubrication of the case would result in increasing the back thrust on the bolt head. Many accidents have occurred throughout the service, which it is believed were directly traceable to the use of grease on cartridges. Accordingly, Frankford Arsenal conducted a series of experiments in order to determine the facts in the case. A number of rifles were fired with and without grease, and pressures and velocities were taken in various ways with and without grease. The results of these tests with the various kinds of grease most commonly used by rifleman are indicated below:

3. **Vaseline.** In this test the bullets were lubricated with vaseline. The ammunition used was National Match 1920 ammunition, 170-grain, and 50.1 grains of DuPont I. M. R. No. 17½ powder. Shot normally, with the bullets dry, this ammunition gave the following pressures in multiple pressure gauge:

Distance from breech, inches --	0.8	5.4	10.8	16.8	22.8
Initial compression, pounds--	46,000	42,000	18,000	6,000	None
Mean pressure, pounds--	51,355	46,595	23,416	10,379	6,554

With the same ammunition, but lubricated with vaseline to include the bullet and neck of the case, the following pressures were obtained:

Distance from breech, inches --	0.8	5.4	10.8	16.8	22.8
Initial compression, pounds--	52,000	45,000	18,000	6,000	None
Mean pressure, pounds--	59,000	49,979	22,459	9,489	6,591

A further test with vaseline was held with National Match 1920 Ammunition not greased, and with Olympic Games 1920 Ammunition, manufactured by the Remington Arms Company, in order to have a comparison between the two. This Remington ammunition contained a 180-grain bullet and Hercules HiVel powder. The following were the results in multiple pressure gauge:

**National Match 1920 Ammunition (Dry).**

Distance from breech, inches --	0.8	5.4	10.8	16.8	22.8
Initial compression, pounds--	None	None	None	None	None
Mean pressure, lbs. -----	46,555	52,490	25,140	12,285	5,917

**Remington, Olympic 1920 (Lubricated).**

Distance from breech, inches --	0.8	5.4	10.8	16.8	22.8
Initial compression, pounds--	None	None	None	None	None
Mean pressure, lbs. -----	58,800	48,950	26,050	12,350	7,100

**National Match 1920 Ammunition (Lubricated).**

Distance from breech, inches --	0.8	5.4	10.8	16.8	22.8
Initial compression, pounds--	None	None	None	None	None
Mean pressure, lbs. -----	60,030	55,415	23,755	10,625	6,387

4. **Graphite Auto Cup Grease.** In this test the bullets were lubricated with ordinary Graphite Auto cup grease, the whole cartridge being lubricated, as would be the case where the soldier was careless and smeared grease over the whole case, as is usually the case where grease is used by troops. The chamber of the pressure gauge was not wiped out during the firing. A rear end pressure gauge, supplied by the E. I. DuPont de Nemours & Company, was used.

(a) With National Match 1920 ammunition the average rear end pressure with ammunition and chamber dry and not lubricated was 43,500 pounds per square inch. With ammunition and chamber lubricated with the grease, the rear end pressure was 52,695 pounds per square inch.

(b) With Remington Arms Company 1920 Olympic ammunition—rear end pressures—Dry, 43,282 pounds per square inch. Lubricated, 55,770 pounds per square inch.

(c) A similar test with National Match 1920 ammunition was held, using vaseline instead of cup grease. Using the cartridge and chamber lubricated, a rear end pressure of 71,154 pounds per square inch was obtained, and the gauge was blown and disastrously wrecked. This gauge is considerably heavier and stronger than a rifle.

5. **Mobilubricant.** Mobilubricant is a cup grease, a product of the Vacuum Oil Company, Rochester, N. Y., and is the grease usually used for the lubrication of rifle bullets. It was used in two ways. First, carefully applied, that is, the bullet only given a light, uniform coating, taking care to get none on the case, as a very careful rifleman would apply it. Second, carelessly applied, getting lumps and smears, not only on the bullet, but sometimes on the necks of the cases, in the manner in which it is usually applied by the ordinary soldier. Regular powder was used. Pressures were taken in regular pressure gauge and in rear end pressure gauge, with the following results:

**Regular Pressure Gauge.**

	Normal Dry	Carefully Greased	Carelessly Greased
Initial compression, lbs. -----	40,000	40,000	40,000
Mean pressure, lbs	48,220	47,290	51,775
Velocity, f. s-----	2,644.7	2,659	2,715.4
Variation in velocity, f. s-----	74	30	80

**Rear End Pressure Gauge.**

	Normal*	Carefully Greased	Carelessly Greased
Mean pressure, lbs., per square inch--	38,925	40,094	41,610

\*With rear end pressure gauge it is always necessary to slightly lubricate the case with light oil, as the case acts as the piston.

6. **Japan Wax and Graphite.** A mixture of ten parts of Japan wax to one part of Acheson graphite, Grade 1340, was prepared. The bullets were dipped in this when hot, giving an even coating on the bullet only. When cool this coating of grease was hard, and it was possible, by loading quickly, to get the bullet fully seated in the bore before any of the grease melted in passing through the heated chamber and greased the chamber. With all soft greases, such as vaseline, cup grease, and mobilubricant, it is not practicable to load the rifle without sooner or later getting the entire chamber heavily greased. Ammunition treated in this manner was fired in regular and rear end pressure gauges. The ammunition used was regular service, 150-grain bullet, standard charge of Pyro D. G. powder.

**Regular Pressure Gauge.**

	Normal Dry	Waxed
Initial compression, pounds--	40,000	40,000
Mean pressure, pounds-----	48,220	48,480
Velocity, f. s-----	2,644.7	2,681.5
Variation in velocity, f. s---	74	120

**Rear End Pressure Gauge.**

	Normal	Waxed
Mean pressure, pounds per square inch-----	38,925	37,135

7. **Cavalry bullet grease.** This was a bullet grease recommended and used by Captain Roy E. Blount, Cavalry. It has been used extensively in the Cavalry, and by the Army Cavalry Rifle Team, and its use has been made mandatory in the 8th Cavalry. Its composition is as follows:

Petroleum Jelley-----	87%
Cocoa Butter-----	6%
Blue Ointment-----	5%
Graphite, powdered-----	2%

It was claimed that this lubricant prevented metallic fouling, made cleaning easier, eliminated after corrosion, and prolonged barrel life. Some of this grease was made up in the laboratory at this Arsenal. It is a soft, black grease, unpleasant to use, injurious to clothing, and has a tendency to flow from the bullet on to the case. It is not possible to get a cartridge with bullet only greased into the chamber without depositing grease in the chamber. Regular service ammunition with 150-grain bullet and standard charge of Pyro D. G. powder was used, and pressures were taken in the regular gauge and rear end pressure gauge with the following results:

**Regular Pressure Gauge.**

	Normal dry	Carefully applied	Carelessly applied
Mean pressure, lbs. per square inch--	46,830	47,850	51,550

**Rear End Pressure Gauge.**

	Normal applied	Carefully applied	Carelessly applied
Mean pressure, pounds per square inch.	38,925	37,335	41,582

In order to determine the effect of this Cavalry bullet grease on accuracy, ten targets (ten shots each) were fired with, and ten without, the grease at six hundred yards, using machine rest, service rifle, and service ammunition, with the following results:

	M.R	M.V.D	M.H.D.	Ex V	Ex H
Normal, not greased	5.50	3.81	3.52	14.36	11.84
Greased carefully	5.84	3.74	3.73	17.38	15.51

**8. Metallic fouling.** The tests clearly show that when the bullets are greased with Graphite Auto Cup grease, mobilubricant, Japan Wax and Graphite, or Cavalry bullet grease, that the deposit of metal fouling in lumps is prevented. A type of metal plating, however, does occur when all of these greases are used. The barrel is evenly plated all over with a thin, almost invisible, coating of cupro nickel. This coating increases in thickness as the rifle is fired. It is not dangerous, nor has it much effect on accuracy. This type of metal fouling is also present when the ammunition is shot dry.

**9. Accuracy.** When any type of grease was used it was found that there was a tendency to increase in the variation of velocities. This increase was very small when the grease was carefully applied, but when the grease was carelessly applied became much larger. Accuracy tests with mobilubricant very carefully applied show no difference with accuracy tests made with the same ammunition shot dry. The accuracy with Japan wax and graphite, and with bullet grease, is not as good as when the same ammunition is shot dry. It can be definitely stated that the use of grease does not increase accuracy, except that it may prevent metal fouling from interfering with accuracy. As usually applied by the soldier, grease is detrimental to accuracy.

On June 18, 1921, a further test was held to determine what effect the use of mobilubricant, carefully applied, has on accuracy. The ammunition used was some loaded for the Palma 1921 competition, with 170-grain cupro nickel bullet, and 48.5 grains (hand weighed) of DuPont EX-1076 powder. Six targets were fired at 600 yards with dry ammunition, and six targets with ammunition carefully greased with mobilubricant, and the following results were obtained:

	M.R	M.V.D	M.H.D.	E.V.	E.X.
Dry, mean	3.05	2.10	1.88	7.82	6.45
Lubri'd, mean	2.84	1.85	1.73	7.12	6.59

The center of impact with the lubricated ammunition was 4.25 inches above that of the dry ammunition. As two series of six targets each with the same ammunition, shot in the same manner, will ordinarily show differences quite as great as those shown in the two series above, this test should not

be taken as proof that mobilubricant, carefully applied, increases the accuracy, but it does seem to prove that it is at least not detrimental to accuracy.

**10. Accuracy Life.** In the absence of an allotment of funds for the purpose, it was impossible to hold tests to determine whether the use of grease on bullets prolonged the accuracy life of the barrel. Inasmuch as the accuracy of a barrel falls off principally from the erosion of powder gases at and in front of the bullet seat, and not from friction, it is believed that the use of grease could only reduce friction, and that its action in prolonging the accuracy life of rifle barrels would be almost negligible.

**11. Conclusions.** The use of grease applied externally to the bullet of the Calibre .30 Model 1906 cartridge does prevent lumpy and patchy metal fouling, and makes the cleaning of the rifle easier by making it unnecessary to use ammonia to dissolve the

metal fouling. With ammunition which gives much metal fouling, the indications are that the careful use of a light automobile cup grease, such as mobilubricant, does slightly increase the accuracy after twenty to thirty rounds have been fired by preventing lumpy metal fouling. Other than this, the use of grease presents no advantages.

The use of grease in the manner indicated presents several disadvantages and dangers. Unless it be applied with the greatest of care it dangerously increases the pressures and the back thrust on the bolt head of the rifle, and it causes a variation in velocity. It is believed that it is not safe to use it because experience with troops has shown that extreme care cannot be insured in its use.

\* \* \* \* \*

(Signed) TOWNSEND WHELEN,  
Major, Ord. Dept., Comdg.  
June 28th, 1921.

## With the Small-Bore in England

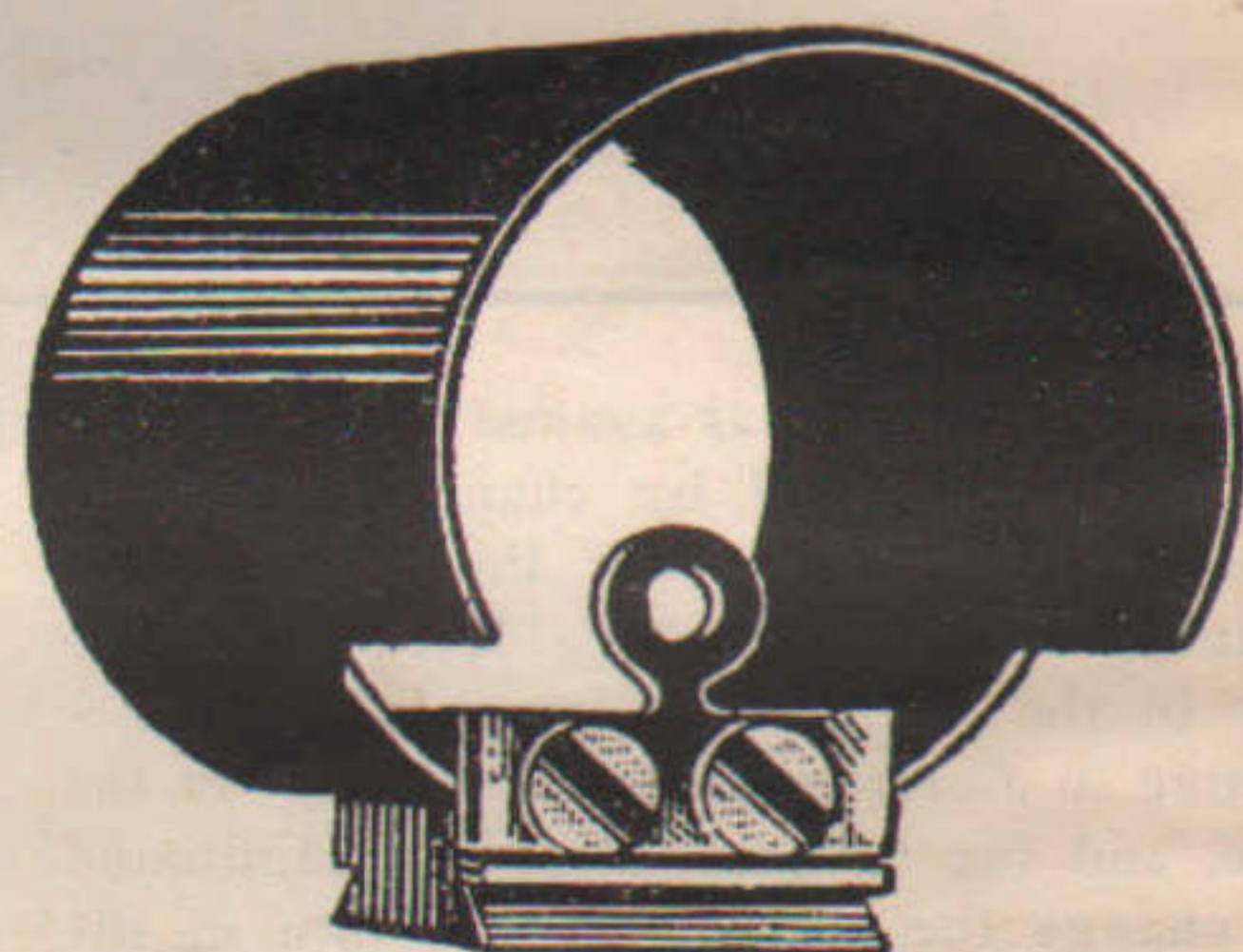
BY A. G. RICKARBY

*Editor's Note: This is the fourth paper by Mr. Rickarby. Another will appear in an early issue.*

CONTINUING my previous article upon our equipment, your readers may perhaps be interested in the various types of rifle sights we use. Space need not be wasted upon the old military pattern open sights, consisting of the "V" shaped rear and barleycorn front, for the simple reason that so far as we are concerned they are now as "dead as mutton," although during the war the old system of sighting was greatly in use upon rifles dished out to the Volunteer Training Corps. With the break up and disbanding of the latter, the old "V" contraptions followed suit and we can only hope that we have seen the last of them.

Mind you, at one time in the early days of the small bore game when my keen eyesight allowed me to become very proficient in the use of the military pattern open sights, upon the change over to the aperture sights, I did not notice the improvement in my scoring that I looked for, but I do know that the fellow lower down in the list who was perhaps not blessed with such keen "peepers" as mine, came very much closer up to me when he made the change.

No. 1 Lyman, the No. 2 of that ilk, in conjunction with their wind gauge front sight, or the No. 14 Lyman ring bead were the first aperture sights to which we were introduced, being easily fitted to the Stevens "Favorites" and "Ideals." Nowadays, both the aforementioned sights and rifles are conspicuous by their absence from our



ranges; at all events in the big shoots. If I remember rightly Greener was the first to put out an aperture rear sight from the home trade, then we soon had aperture pattern rear sights intended for the War Office bolt action rifles, these having an eyepiece working upon a pivot for lateral adjustment, and a very unsatisfactory arrangement at that, for in attempts to correct for wind, one would upset the elevation.

The B. S. A. No. 8 and No. 8a rear sights are with us to-day and have been in use for some years now, improvements having of course, been made since they were first put upon the market, but they easily fill the roll at "top of the bill" as sights go over here. No. 8a is so-called upon account of its 6 hole adjustable eyepiece, which is a great trap for the unwary, in fact, I am of opinion that adjustable eyepieces are not alto-

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gether satisfactory as against slight advantages to be gained by changing sizes of aperture to suit varying lights, one may write off on the opposite side the possibilities of the pivot screw becoming loose, resulting in a certain amount of "play" in the disc, and the temptation to the uninitiated to change the size of the aperture in the middle of a string of ten shots and more often than not his group at the same time. I have seen many a fellow come unstuck through playing about with one of these adjustable jokers.

I am quite prepared to trust to the old reliable one size aperture eye cup, and in a dull light get my eye as close up to the disc as possible, adopting the method of bringing the eye away from the eyecup when there is a bright light.

The B. S. A. rearsight of the latest type when fitted with disc hole adjustable eyepiece retails at about £1 11 6, a considerable advance upon pre-war figures—the sizes of the six holes are: .03, .04, .05, .06, .07, .08 inch, and of these apertures I prefer the .05 for general all round work. This sight is fitted with clicking mechanism which is a decided advantage when shooting upon an indoor range and adjustments have to be made in the dark, but for outside work I always revert to the old habit of reading the vernier scale to make sure. The No. 52a Lyman rearsight with lateral adjustment at the head of the stem was in demand at the

beginning of the war, when practically no other sights were obtainable, followed by the Lyman Micrometer rearsight. The 52a developed too much play after a very little use, but the Micrometer sight like all Lyman sights was beautifully made, and I would prefer that sight to almost any other, although the use of one in a championship shoot brought me down a nasty bump, through the spring of the locking mechanism giving out when in the middle of a string of 100 yards, four of my shots getting "into the country" before it was possible to tumble to what had happened.

The Vickers sights, used upon the Vickers rifle, is somewhat similar to that of the B. S. A. No. 8, the same method of elevating by means of the knurled screw at top of stem, but with this sight, no adjustable eyepiece is supplied, and the clicking mechanism is not adopted as in the B. S. A. sight. Desired movements of the screws in elevating and lateral adjustments appear to respond very easily, perhaps rather more easy than one would wish. This sight is not adapted to fit any rifle but a Vickers, and while your Lyman sights are made in various patterns to suit American rifles, the B. S. A. rearsight, by the addition of a special sight base plate which is supplied when ordered, can be attached to the tangs of Stevens rifles or other rifles the tangs of which are tapped with screw holes the same distance apart as a Stevens.

One inventor chap, who spends all his time in bringing out various contraptions, brought to me in 1914 a rearsight, which he claimed to be "fool-proof" against canting. Somewhat similar to an ordinary aperture rear sight and elevated by means of a knurled sleeve, at the head of the stem the eyepiece had a very thin shutter immediately in front of it, loosely suspended from a pivot at the top of the eyecup. Through the center of this thin shutter the aperture was drilled, the idea being that if the rifle be held plumb upright one would get a clear view through the shutter and eyecup, whereas if any cant was on, you would see "nowt." Needless to say the swing of the shutter was very sensitive and one can imagine any shooter inclined to develop a wobble having the "devil's own job" to find the hole.

Turning toward the other end of our gun, from which emanate the 4's 8's and other things we do not like to see, we may reckon that in this country we have three different patterns of foresights, all equally popular. First we get the merchant who swears hard and fast by the ring foresight, then t'other chap who plums for the barleycorn, and a third all out for the knife blade. The bead is very very little used in this country, although I had some very good shooting with one at the Welsh meeting at Wrexham in 1913 when at 100 yards, for fifty successive

(Continued on page 14)



## 100 Consecutive Shots at 1000 Yards

This group is a composite of the 100 shots fired from the Mann V rest with the winning lot of .30 caliber ammunition in the Palma Ammunition Test held at Quantico, Va. It measures 20.5 x 14.0 inches. The mean radius of the ten strings is 4.29 inches. This ammunition was loaded with Hercules HiVel Powder.

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**THE SMALL-BORE IN ENGLAND**

(Continued from page 12)

shots I bagged two 99's, two 98's and a 97, with the sun streaming straight into one's face making the black bull appear gray, the bead front sight standing out easily in the center of the gray "blob." After the first shot for each target the telescope was put on one side, each target being fired without spotting.

Now, the rings in use lead to all sorts of discussion, one wants a fair-sized aperture with a lot of metal round it; another goes the other way and so on, and although I could at one time do well with a heavily metallated ring, getting older seems to call for a lighter pattern. From experience, it answers my purpose to use one size ring for 25 or 50 yards only, and switch over at 100 yards to a ring just a shade larger in the aperture than that used at the shorter ranges and this appears to be the fancy of many others over here. Still I have kinks in my eyesight or something, for curiously enough, a rifle sighted dead on to score cartons by myself upon handing the rifle to others will give them 8's and 9's at four o'clock, and if I collar hold of another chap's gun I bust up his run of cartons by putting the shots out at ten o'clock.

Wandering back to our subject the B. S. A. and Vickers front sights cater for the ring and blade, or ring and barleycorn fellows, the change from one sight to another being effected by the small lever at the side of the tunnel, under the tip-over arrangement—see that it is tight, that's all, otherwise trouble awaits. American interchangeable disc foresights with rings and beads have been considerably used, but there was a demand for the latter to be substituted for blades and barleycorns, and these discs were made over here to fit. Unfortunately the continual changing of these discs are wont to open the slide leaving the discs loose, constantly needing careful watching, and almost surely one gets different vertical and

lateral adjustments to make for each disc, upon making a change over; a bit of a nuisance this. I confess to being the guilty person to make the rifleman over here cuss a bit more, by putting out a foresight having a removable hood or tunnel, so that in bad lights without the tunnel on, the sight itself would get all the possible light and it is especially useful for sporting rifles or for our disc breaking or "egg" smashing competitions at 100 yards (real eggs were used at one time, hence the name, but when chickens almost came and the eggs got so bad that range attendants dared not go near to put up "fresh" eggs, we switched over to plaster discs.) A sketch of my foresight is shown here thereby enabling the interested to follow the idea more easily. The sight pieces rest upon a small ledge in front of the base of the sight and are held firmly in position by two set screws with wide slotted heads to be released or tightened up by using a small coin. Sufficient lateral adjustment is possible as the sight pieces have oval shaped holes thro' which the set pins or screws pass, and when the latter are loosened the sight piece can be laterally adjusted, the zero for each sight piece being marked upon the same to agree with that on the base. All you have to do is to lose a few of the sight pieces, go and buy some more and so the game goes merrily on—for the gunsmith. The sight is very convenient for either a sporting or a target rifle, any ingenious customer being able to knock out a sight piece of his own liking, if either the blade, ring or barleycorn pieces do not appeal to him.

Our knife blade sights (why they should be called knife blades I don't know) vary in width, some shooters preferring 1/16" blades, others 1-8", and I have seen some made sufficiently wide enough to go straight across a 100 yard target from edge to edge. The bulk of the men prefer to take aim at 6 o'clock, allowing the bull to rest upon the top of the foresight, but there are others (I plead "guilty" when using a blade) who prefer to bring the foresight down from the



**MARBLE'S**

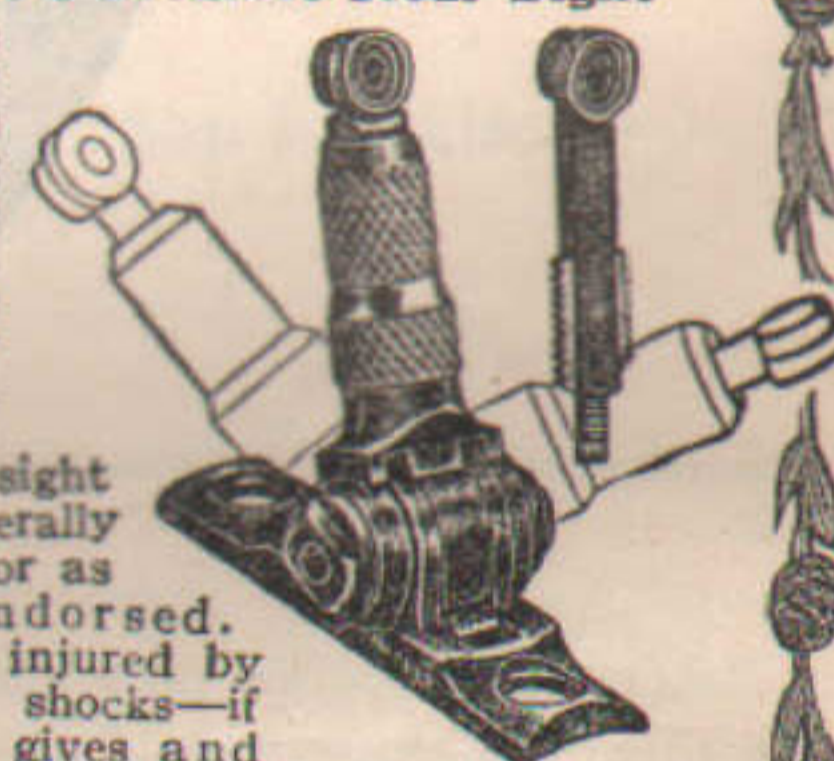
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By MAJOR TOWNSEND WHELEN

General Staff, U. S. A.

Chairman Small-Bore Committee, N. R. A.

Contains score sheets suitable for all forms of small-bore shooting, so that riflemen can keep all their scores and records as to sight adjustment and weather under one convenient cover. The book also contains all the practical information necessary for expert shooting with any of the more popular or suitable small-bore rifles, and is based on actual firing by Major Whelen, and *not* on usual information as to ballistics, hence is *practical* and *reliable*.

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top of the target, getting just into the black until the round top of the bull makes a sort of hump appear upon the sharp edge of the foresight—a really good elevation may be kept with this aim if one is holding anything like. The blade sight is a popular favorite when the green elliptical bull target is used for time limit competitions—ten shots in 90 seconds stunt, and if a census was taken it is certain the preference of the blade over the ring for this class of target would be assured. One wants all the light possible, which is not obtainable with many rings, unless in a very good light and we do not shoot at more green targets in a dull light than we can help; that you may be sure of.

We get freak sights naturally and no doubt you have the same gun cranks with something special, but right through we are entirely confined to sights not containing glass which is equivalent to your iron sight's rule. One shot I know in particular uses to advantage (having got away with two open championship gold medals) a foresight consisting of a tube containing cross hairs, to be exact, cross wires, extracted from electric wire cables, the wires being set sufficiently apart to prevent picking up dirt and etc., at point where they cross. Yet another chap a short time since "pinched" a competition putting up three running possibles, his foresight being stuck on temporarily with a spot of fish glue, a piece of string, sundry pins,

and what not. The only "protection" he had was the one above and that shooter's motto was evidently "You never can tell."

**AT WAKEFIELD**

(Continued from page 6.)

- 3. Corpl. L. D. Wilson, U. S. M. C. 50
- 4. Pvt. R. C. Glenn, U. S. M. C. 50
- 5. Corpl. S. L. Stephenson, U. S. M. C. 50
- 6. Pvt. S. A. Moraski, U. S. M. C. 50
- 7. Capt. H. P. Detwiller, C. A. C., U. S. A. 50
- 8. Sgt. E. F. Holzhauer, U. S. M. C. 50
- 9. 1st Lieut. W. J. Whaling, U. S. M. C. 50
- 10. Major H. J. Kneer, C. A. C., U. S. A. 50
- 11. Sgt. G. B. Ping, C. A. C., U. S. A. 50
- 12. Capt. J. Jackson, U. S. M. C. 50
- 13. Pvt. E. J. Nelson, U. S. M. C. 50

Followed by 17 more possible scores not in the money.

**No. 3. The Campbell Match.**

85 Entries—13 Prizes.

Bull's-eyes.

- 1. Sgt. Thomas J. Jones, U. S. M. C. 50-122
- 2. George L. Cutting, Worcester R. & P. Club 50-90
- 3. Corp. R. C. Glenn, U. S. M. C. 50-11

- 4. Sgt. W. F. Liell, U. S. M. C. 50-6
- 5. Mar. Gun. C. A. Lloyd, U. S. M. C. 50-6
- 6. Mar. Gun. O. Wiggs, U. S. M. C. 50-6
- 7. Corp. J. R. Tucker, U. S. M. C. 50-1
- 8. Sgt. J. W. Coppens, U. S. M. C. 50-1
- 9. Corp. S. L. Stephenson, U. S. M. C. 50-1
- 10. Mar. Gun. J. J. Andrews, U. S. M. C. 50
- 11. 1st Lt. G. W. Trichel, C. A. C., U. S. A. 49
- 12. Capt. H. C. Barnes, Jr., C. A. C., U. S. A. 49
- 13. Sgt. T. B. Crawley, U. S. M. C. 49

**No. 6. The McKenzie Match.**

99 Entries—14 Prizes.

- 1. Pvt. G. M. Jefts, Mass. 50-4
- 2. Corpl. L. D. Wilson, U. S. M. C. 50-1
- 3. Sgt. T. J. Jones, U. S. M. C. 50
- 4. 1st Sgt. E. S. Stake, U. S. M. C. 50
- 5. Capt. G. del Carrington, C. A. C., U. S. A. 49
- 5. Pvt. R. C. Glenn, U. S. M. C. 49
- 7. Lieut. W. K. Queen, A. & H. A. Co. 49
- 8. Sgt. T. O. Lowery, U. S. M. C. 49
- 9. Sgt. J. Wertzberger, C. A. C., U. S. A. 49
- 10. Maj. S. W. Stanley, C. A. C., U. S. A. 49
- 11. Corpl. G. R. Lee, U. S. M. C. 49
- 12. Capt. J. Jackson, U. S. M. C. 49
- 13. Sgt. T. B. Crawley, U. S. M. C. 49
- 14. Corpl. L. B. Bowen, U. S. M. C. 49

Fifteenth score, 48.

## Hayden and New England Interstate Matches.

(Teams marked \* are entered in both matches.)

Organization.	S. F.	R. F.	R. F.			
U. S. Marine Corps Team No. 1.....	200	200	300	600	1000	Aggre.
U. S. Marine Corps Team No. 2.....	434	498	491	964	889	3276
Coast Artillery Corps Team No. 1.....	437	494	486	933	876	3226
Coast Artillery Corps Team No. 2.....	424	484	487	929	882	3206
Coast Artillery Corps Team No. 3.....	424	481	469	923	861	3158
Coast Artillery Corps Team No. 3.....	425	466	467	904	823	3085
*Massachusetts Team No. 1.....	415	475	461	917	789	3057
*Massachusetts Team No. 2.....	405	428	433	850	748	2864

Marine Corps Team No. 1 winning the Hayden All-America.  
 Massachusetts Team No. 1 winning the New England Interstate.

## Special Team Match.

(In substitution for the Bancroft Match.)

200 Yds. off-hand and 600 Yds. prone.  
 9 teams entered.

First—United States Marine Corps, Team No. 1, 200 yards, 265; 600 yards, 293. Aggregate, 558.

Second—United States Marine Corps, Team No. 3, 200 yards, 261; 600 yards, 285. Aggregate, 546.

Marine Corps Long Range Trophy Match.  
2 Man Team.

2. Pvt. S. A. Moraski, U. S. M. C.	47	48				
			600	1000	Ag.	
1. Sgt. C. A. Porter, U. S. M. C.	50	47				
Sgt. W. F. Liell, U. S. M. C.	48	49				
	—	—				
	98	96	194			
Mar. Gun. O. Wiggs, U. S. M.						
C .....	49	48				
	—	—				
	96	96	192			
3. 1st Sgt. A. J. Bozesky, U. S.						
M. C.....	49	48				
Sgt. A. F. Frederick, U. S. M.						
C .....	49	46				
	—	—				
	98	94	192			

Note: Scores in Matches No. 4, 5 and 7 will appear in the next issue.

The Wakefield Matches were run off without a single hitch and proved to be a marked success.

In handling the range a concise set of rules prepared by the Chief Range Officer were used. They may be of interest to the executive officers of civilian clubs and are printed herewith:

## RANGE OFFICERS (FIRING LINE).

1. You are directly in charge of the targets assigned to you.
2. You must know the rules governing the competition, and see that the same are being carried out to the letter.
3. You are to verify the total score of each competitor, and to constantly watch the work being done on your score boards and targets.
4. After each stage the score sheets are to be signed by you after you have carefully checked the totals, and those sheets are to be turned in to the Chief Range Officers on the firing line.
5. You have no time to chat with your

friends. Keep on the job every minute and see that there are no unnecessary delays.

6. Read Bulletins No. 4, War Dept., March 12th, 1921, or Rifle Marksmanship, War Dept., June, 1920. Look up especially the duties of range officers in competitions.

7. Remember that you are there to see that the competitors get a fair and square deal, that he gets all the points that are rightfully his, nothing more or less.

8. Anything which occurs on your block of targets which you are in doubt as to the procedure, call on the Chief Range Officer and while the question is being decided order "cease firing" on that target.

9. Unless your scorer has failed to get the value of the hit on a target there will be no remarking. You can inform the competitor that all targets are examined carefully by an officer in the pit before a "miss" is signaled.

10. Your scorer communicates with you and you repeat the message to the telephone. For example: Scorer will say "Range Officer, Mark number Six (6)." You repeat "Mark Six (6)" loud enough for the telephone operator to hear you.

11. In rapid fire you will call out to scorer the value of the disk as target is marked the scorer will record the same on blackboard.

## RANGE OFFICERS (BUTTS).

1. Make certain that you understand the rules governing the competition, and also

read and study carefully Bulletins No. 4, War Dept., March 12th, 1921, or Rifle Marksmanship, War Dept., June, 1920, especially with reference to marking targets and duties of range officers in general.

2. You must see and examine all targets in your block assigned to you, before you allow any misses to be signalled.

3. Remember that **accuracy first, speed second.**

4. Watch your workers constantly. Allow no magazine reading or loud talking while the firing is going on. Keep your men interested by keeping record on the right of the target in pencil, of the value of each hit, then you will know and so will they, when the stage is about to be completed. You also have a complete record for reference in case any dispute arises.

5. If a shot strikes and cuts the black circle or ring, you always give the higher value; cutting or breaking black of bulls-eye a five; cutting black of four ring (4); etc.

6. When you examine a target first examine the bulls-eye, then the four space around the bulls-eye, then the black four ring, then the three space, etc., and be most careful and accurate. A mistake may be the most costly to not only the competitor but his team as well.

7. You and your markers must be alert and watch and listen for hits on the targets.

8. Nothing helps like efficient service in the butts and you get through that much sooner, too.

9. Keep your markers at their own targets. It is all that one man can do and do well. He has no time to talk over and chat with his neighbor.

10. Allow no one to leave the butts until the stage of the competition is finished.

11. When marking targets in rapid fire, run up and disk one target at a time, so that the range officer at firing point may verify the score.

## The Sportsman's Telescope

BY L. E. EUBANKS

FEW things are of more importance to the outdoorsman than a "glass." Hikers, campers, sportsmen of all kinds, miss half the pleasure and instruction if they enter the wilds without an instrument of some kind with which to annihilate space and bring distant objects within their view.

There are a number of different glasses, but I shall talk of telescopes, because I know more about them and know they will make good, if handled right.

Perhaps the most common mistake in

buying a telescope is to get one of too much power. Magnification of power is a matter of relation between the focal length of the objective lens and that of the eye lens. Generally, telescopes are commercially described as 1", 2", 3", etc., glasses, classing them by the size of the objective lens. The smaller instruments have powers ranging from ten to fifteen times the objective. What you want is all the power you can get while yet avoiding a too small aperture. But to forget the latter, as many buyers do, means that your instrument will



be of little use except in the best of light. Field of view, and steadiness, are just as important as power. Some telescopes are equipped with several "draws" at the eye-piece end, making the instrument somewhat adjustable to different powers.

In material, I favor aluminum for a telescope. You can get it in other stuff, and it will be stronger—as regards resistance to falls, accidental pressures, etc. The salient feature of aluminum is its lightness of weight. To a person who takes the proper care of his instrument, the comparative softness of aluminum need be no objection. An iron watch might be more durable than a gold one, but we rather have the gold one, and exercise more care. I do think, however, that it is advisable to have brass where the lenses and slides screw on. An aluminum screw ring mashes too easily if one gets in a hurry and handles it a bit roughly, and may after a while let the instrument sag at the joints. On binoculars, too, it is a good plan to have all screw parts of some harder stuff than aluminum.

Few people use a telescope properly. It is troublesome, and a waste of time, always to wait till the instrument is at the eye to adjust it. Draw it out to full length, focus it on an object at about the average distance at which you expect to "take observations," and mark the place of proper adjustment with a pin scratch around the eye-piece draw-tube where it enters the first ring.

There are a number of ways to hold the telescope. Walter Winans gives the following directions, with which I heartily concur: "Put the first and second fingers of one hand round the eye-piece, and put the thumb along the cheek, the little finger against the mouth, and the tips of the other fingers touching the nose. In this way you shut out external light and avoid poking your eyes, the other hand extended and holding the larger end of the telescope."

Sunlight makes a telescope glitter, and this seems unavoidable, because paint prevents the slides from working smoothly. Polish it has to have, and, of course, this means more or less glitter—and a certain danger of betrayal to the deer or other animal upon which the sportsman is "spying." A good many users avoid this glitter by being careful to point the telescope directly at the object. Naturally, angles greatly increase the flash and glint on any metal. Also, it is helpful to keep the telescope horizontal and close to the ground. For this reason, and because it conduces to steadiness, many persons always recline before pointing the glass. Usually, they rest the left hand, as it supports the big end of the instrument, on a partially raised knee. This is a favorite position. When a telescope has to be much used in sunlight and the glitter defeats the user's purpose, it is well to make a suitable cover, preferably of gray cloth. I have heard of sportsmen's using a coat-sleeve "in a pinch."

All high-power telescopes should be used on a tripod, or some similar support; in fact, the instrument, in any power, always gives better satisfaction when mechanically supported, because of the great improvement in steadiness. Of course, the tripod mountings should give a good latitude of movement, vertical, horizontal—any angle likely to be required.

In the long run, it is better to hold both eyes open in using the glass, just as it is in shooting. There is less strain on the optic nerves, and it is but a matter of training until you can "blind yourself" to the observations of the unused eye and concentrate on the "aiming." Try to use one eye as much as the other. Be careful not to use a telescope or binocular more than actually necessary just before shooting a gun; it tends to tire the eyes.

Like spectacles, the lenses of a telescope must be kept clear. In dry weather a piece of chamois will keep them clean, but this cleaner must be kept free from grit. A thin silk handkerchief is usually recommended, but I always found cambric more effective. In wet weather the lenses will "fog," but rubbing them with vaseline helps to prevent this. Some opticians sell a preparation, called Lasin, that is said to prevent fogging, but I have had no experience with it. When the instrument has been often exposed to wet weather during a day's use, it is well to take it apart and let the pieces dry over night by a fire.

Keep the telescope in its case when not in use or drying. Sportsmen who expect to need concealment in their use of the glass prefer gray as a case color, but this is a minor point. The "bayonet" catch is handier on a case, but it makes more noise than a buckle and strap.

Has Game a Cash Value?

**H**AS game a cash value to a community? Is it an asset? Is it worth anything aside from furnishing health to the community in the recreation and exercise gained by its pursuit? The Board of Game Commissioners of Pennsylvania have prepared the following table showing the amount of game animals and birds killed in that state. Only 8 per cent of the gunners in Pennsylvania returned a report to the commission, showing the amount of game they killed last season. Taking the reports received from the 8 per cent, together with the number of licenses issued, the figures for the total amount of game killed were obtained.

	Estimated killed
Birds and animals	
Deer, legal bucks.....	3,300
Bear, black.....	420
Wild turkeys.....	3,000
Rabbits.....	4,932,000
Snowshoe rabbits.....	70,200
Squirrels.....	1,230,000
Raccoons.....	82,200
Ruffed grouse.....	507,600

Ring-necked pheasants.....	42,000
Quail.....	79,800
Wild geese.....	2,640
Wild ducks.....	81,000
Blackbirds.....	309,600
Reed birds.....	65,520
Yellow-legs, snipe, rail, plover and woodcock.....	18,000

This shows 7,427,280 pieces of game killed, or 13,785,410 pounds of choice meat, using a conservative weight for each piece of game. Figuring this meat at 40 cents per pound, gives \$5,514,164, as the cash dividend returned last year from Pennsylvania's game.

Supply of Krag's Exhausted.

The Ordnance Salvage Board reports that the supply of Krag rifles, model 1898, has become exhausted. There is available, however, a supply of Krag rifles, models 1894 and 1896, which may be substituted for the model 1898 rifle.

The Quartermaster Department reports that the supply of field glasses has become exhausted.

The sale of rifles and other ordnance equipment will be suspended from August 25th to September 30th. This suspension is necessary as regulations require that all sales be approved by the Director of Civilian Marksmanship and the Director of Civilian Marksmanship will be on duty at the National Matches at Camp Perry, Ohio, and therefore, will be unable to approve the requests to purchase supplies which are received in his office.

C. E. Stodter,  
Colonel of Cavalry, Director.

# The American Rifle

By Lt.-Col. Townsend Whelen

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## Loads And Re-loads

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

RECENTLY I obtained a Sharps-Borchardt carbine, of apparently .45 calibre. The barrel is badly rusted, however, the action seems to be in very good shape. It has been used, and shows it, but is complete, and does not seem to be worn badly nor sprung in any way. What I wish to know is this: I have for years longed for a hammerless single shot rifle made to handle the Savage .250-3000 cartridge. Is this action sufficiently strong to stand up for this load? It would be called on to stand for less than 40,000 pounds, as the Savage Company now load this ammunition, I understand. My idea, if it is possible, would be to have a 20 or 22 inch barrel fitted to this action, Lyman sights, and probably new stock, and, of course, new forearm. I believe the arm would be a dandy, and just what I have longed for. It is probable that I would never use the regular full loads in it, but something between the .25-20 and the .25-35. If you deem this change possible, whom would you suggest for me to go to have the work done. It may be only a dream, but, dream or not, it listens good to me. Thanking you mostly kindly for your reply, I remain,

A. H. T., Littleton, Colo.

Answer: I have received your letter of March 26th, 1921, relative to the Sharps-Borchardt carbine remodeled to handle the Savage .250-3000 cartridge. The old type breech block is not sufficiently strong for this cartridge. You would have to have a new breech block fitted with a new high pressure firing pin. This would make the rifle perfectly satisfactory for this use, except that you might have trouble in getting an extractor designed so that it would efficiently handle the Savage rimless case.

I refer you to A. O. Zischang, Syracuse, N. Y., and to the Neidner Rifle Barrel Corporation, 612 Spruce Street, Dowagiac, Michigan, relative to having this work done. They both have done this work before and understand it fully.

UNDER Loads and Reloads in Arms and The Man the writer has noted your instructive answers to the many questions

asked of you, and being a member of a new rifle club which we have just organized here, wishes to secure some information.

Being near-sighted, it will be impossible for me to use the iron sights at the different ranges on the standard targets, but I am contemplating securing my own rifle purchasing a rifle for my individual use on the short ranges on which I shall have a telescope sight mounted—something I can use on the indoor ranges and on the outdoor ranges up to 100 yards.

Being in moderate circumstances I should like to get the best shooting .22 I can for the least money. I see the B. S. A. rifle is highly recommended, but I am afraid I cannot afford one of them just at this time. For accuracy of fire up to the 100 yards how will the Stevens .22, model No. 70 or the Remington 24-inch barrel, Model 12C shoot, as compared to the B. S. A.? Both these rifles are considerably cheaper than the B. S. A., but I wouldn't want either if they were not good shooters. Is the B. S. A. a repeater?

Is it possible to buy a disc peep sight which can be mounted on the stock of the Springfield rifle so that the stock will not be injured, such as by screw holes or the like? I am not able to buy a Springfield now, but would like to use such a sight on one of the guns the War Department has furnished our club with.

What, in your opinion, is the best telescope sight to buy for either the Springfield or one of the .22 rifles? I would like a good sight at a reasonable price. Where can one be secured?

At the Camp Perry annual shoots I am told that competitors have to use the regular iron sights on their rifles. Would it be possible to shoot with telescope sights and not have your score officially counted? I would realize that I would have an unfair advantage of the rest of the competitors, but I have often thought I would like to attend such a tournament.

L. F. C., Underwood, Ind.

Answer: The B. S. A. rifles and the Winchester No. 52 bolt action rifle are both about on a par as to accuracy. The B. S. A. rifle is rather expensive. By becoming an annual member of the National Rifle As-

sociation, you can then purchase a Winchester bolt action Cal. .22 No. 52 rifle through the Director of Civilian Marksmanship for \$38.00. This would be the most excellent weapon, and one with which you would not be handicapped. With either the Stevens Model No. 70, and the Remington model rifle you would be slightly handicapped, as these are light hunting weapons and are never intended for fine accuracy in match shooting, nor will they give such fine accuracy.

The only telescope sight on the market which is really satisfactory is the Winchester A-5 sight, with No. 2 rear mount. If you cannot afford this, I would not attempt to get any other. There is no use wasting money on what will not be satisfactory.

There are certain competitions at Camp Perry in which the telescope sight can be used, and there are others in which it cannot be used. You can always enter the practice matches with any equipment you wish, and if the equipment is not permitted in that practice match it is simply so marked on the score cards and you do not get the usual medals for it.

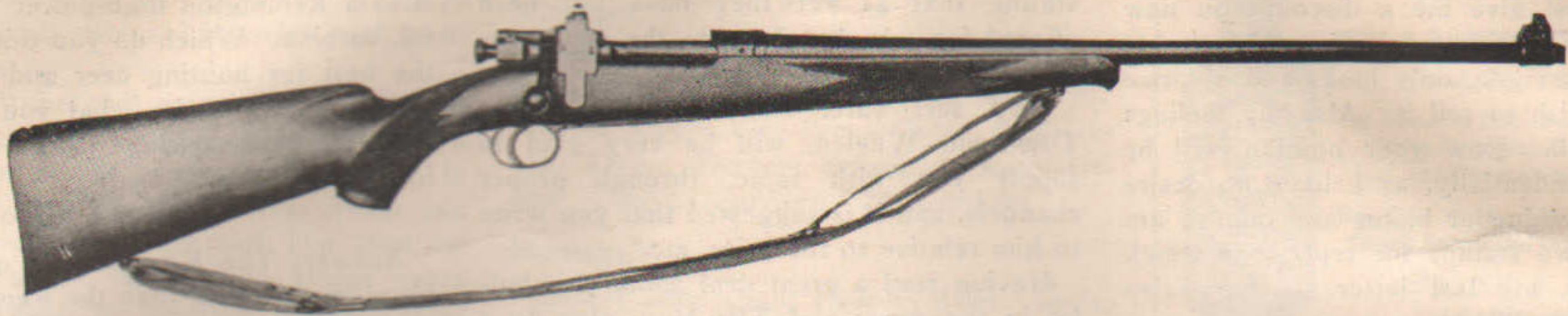
MAY I venture to ask your advice as to the best target load for my Winchester single shot .30-40, which is fitted with 30-inch No. 3 barrel. Using the R. A. 1917 Krag .30-40-220 I get groups at 200 yards averaging 5 inches for about 7 out of 10 shot strings, the two or three off shots enlarge group sometimes to 12 inches with good holds, prone with padded muzzle rest. Don't think off shots entirely my fault as I don't have many when I shoot my Springfield under same conditions.

I wish to reload with 170 or 180 grain pointed gilding metal bullet, loading forward in shell so bullet will touch rear end of barrel. Which bullet would you recommend as best for accuracy and what powder load should give best result? I only have No. 16 and No. 20 DuPont. Please give this by weight.

I will use this load for 200 yard offhand target shooting only, while would like good velocity, as it helps break wind. Don't want to sacrifice accuracy to velocity, provided I don't fall below velocity of regular 220-grain bullet in Krag load about 2,000 f. s. Also don't want to bring on any more recoil than necessary so would not think it advisable to run velocity up over 2,400 f. s.

I hope to be able to eliminate some of the off shots in group above mentioned, by doing away with the jump off now present with the 220-grain bullets now used. Some of these shells, about one in ten, split at the neck when fired, which I don't suppose helps any. No doubt Major Whelen with his long experience with .30-40 S. S. Winchester has in the past used such a load as I require, and I will be more than grate-

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pistol-grip cap and checkering	\$37.00	S S S front band (encircles barrel and fastens through forearm)	3.50
Furnishing and fitting No. 48 sight	15.00	Set screw for adjusting trigger-pull	2.00
Removing military rear sight, turning polishing and re-blueing barrel, 5.00 to 8.00	3.00	Webb sling	1.80
S S S hand checkered butt-plate	3.00	S S S gun case	4.50

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S S S subchamber for .30 '06 rifles	\$1.00	Watson's Luminous Sights for .45 Colt Auto Pistol, per pair	\$3.50
S S S Cumpston patchthimble	1.00	Hollifield Target Practice Rod Outfits	
S S S Wood checkering tools, per set	7.50	Beach Pistol Training Device	
S S S Special pistol stocks—made to fit your hand and fitted to your pistol or revolver	3.00 to 7.00	Adjustable webb sling	1.80
		Few more new magazines for .45 auto pistol, each	.50

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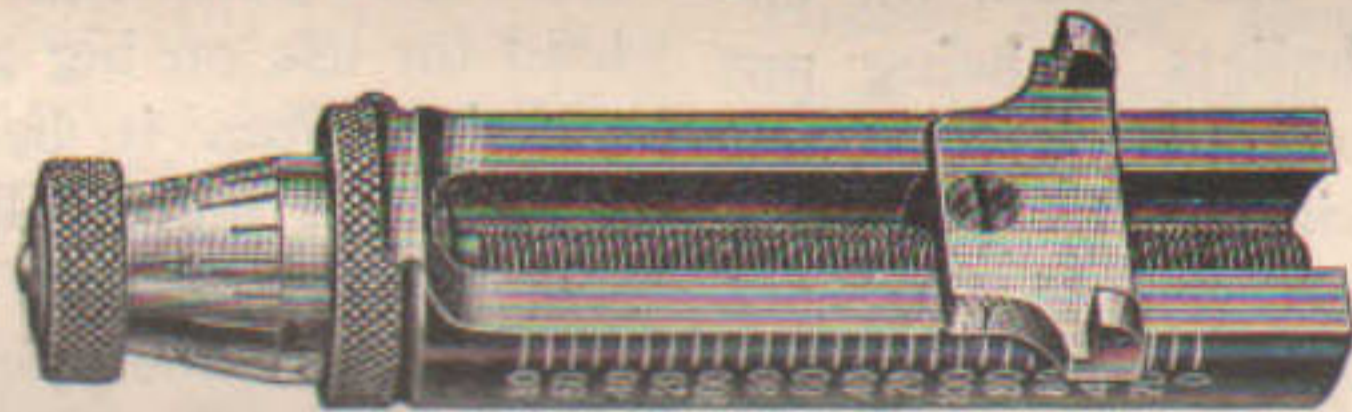
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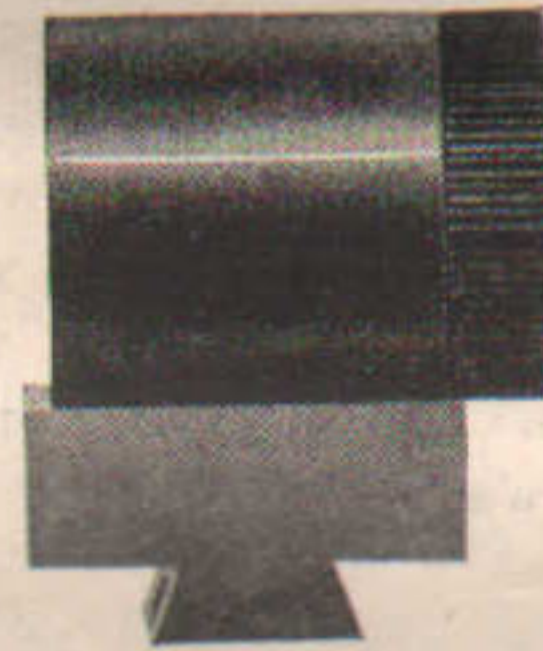
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**H**AVE just received a National Match rifle, remodeled into a Sporter by one of the best gunsmiths in that business. It is a beautiful rifle. Everything a gun crank could desire, but on firing it a large crack opened up on top of grip, starting to the left of the center of the rear end of receiver, running at an angle of 45 degrees to the left almost to top line of checking, which it follows, then turns into center of grip, which makes me believe that when fired the receiver was forced back into top of grip and is forcing a large chip out. The crack is over an inch long. Now what I wish to know is who is responsible, if any one, or is this just a risk one runs when having this work done. There was not a crack visible before I fired rifle, but I believe if stock had more clearance around rear end of receiver; that is, under cocking piece, this would not have happened and to

ful for the benefit of his advice. Thanking you in advance for a reply. Addressed envelope enclosed.

L. F. R., Sacramento, Cal.

Answer: The ammunition which you have been using in your .30-40 Winchester single shot rifle is evidently war ammunition, and the inaccuracy is due to the speed with which it was made and the tolerances allowed for such ammunition. I would strongly recommend that you use the 180-grain full jacketed pointed bullet, made by the Western Cartridge Company, East Alton, Illinois, and jacketed with lubaloy. 37.5 grains weight of DuPont No. 20 powder will give you a muzzle velocity of 2,244 f. s., with a pressure of 40,200 lbs. About 42 grains of DuPont No. 16 powder

should give you a muzzle velocity of about 2,500 f. s., with a pressure of about 42,000 lbs. I am rather inclined to think that the first mentioned load would be a little bit more accurate than the last, but only a test in your rifle will determine this. With both loads the bullet should be loaded projecting from the case so that it just touches the lands when the bolt is fully closed. The recoil with either ammunition will be quite as severe as with the 220-grain regular load. I think this ammunition ought to shoot very well indeed.

The splitting of the cases at the neck is not altogether due to the velocity, but is due to poor war time brass and to cartridges which have remained loaded a long time, thus putting the brass under tension at the neck of the case.

some extent is due to faulty workmanship and also partly due to grain of wood.

Now the question is: Would he make it good or just give me a discount on new stock or do I have to stand total loss. It does not hurt gun, only looks and of price if I ever wish to sell it. Also my feelings worst of all. Now your opinion will be treated confidentially, as I have no desire to start anything or blame any one. I am enclosing two stamps for reply, one which I forgot in my last letter. I have also written gunsmith.

M. W., Winnemucca, Nev.

Answer: I have your letter of May 15th, regarding the split sporting stock on your Springfield. This may be due to poor wood which was liable to split anyway, or it may be due to poor workmanship. If the wood is good, the stocker, if he is skilled, will so fit the receiver and guard to the wood that they will be fully supported on recoil, and will not come back and wedge the stock apart and split it at the rear of the receiver. If, however, he does not do this work very carefully, or is not sufficiently skilled, then he should cut the stock away just a little bit at the point at the rear end of the receiver, so as to prevent splitting here. Most stockers do not take the pains and time to fit the stock so that it cannot possibly move on recoil, but instead cut away a little bit at the rear of the receiver. A first-class stocker could tell you upon examination whether this matter is the fault of the wood or the fault of the stocker. There are very few stockers, indeed, in this country who can do such fine workmanship that they do not have to cut away the stock at the rear of the receiver.

I AM at work remodelling a Springfield, but do not know how to remove the front sight band. I want to put a sling-strap swivel and band on the rifle and would like to have you advise me as to the best method of removing the aforesaid band without injury to the rifle barrel, also how to refasten it to the barrel.

O. E. B., Carson City, Nev.

Answer: The front sight band is secured to the barrel by a pin which passes through the band near its rear end and bites half way in to the top surface of the barrel. This pin can hardly be seen on account of the bluing that is placed on the rifle, but if you will polish the bluing a little bit toward the rear of the band and in line with the top of the barrel, it will become visible. It should then be driven out with the drift pin, driving it from right to left while holding the muzzle of the barrel in a heavy vise so as not to run any danger of bending the barrel. When this pin is driven out, the front sight band can be driven off the barrel by driving from the rear toward the front. To place it back again simply reverse the operation.

ON June 27th I addressed a letter to N. R. A. regarding the new 170-grain tinned bullet, and on the 6th inst., received a reply stating that as yet they have not been offered for sale, but I quote the last paragraph of their letter:

"We feel sure, however, that Major Townsend Whelen, will be very glad to supply you with same, through proper channels, and it is suggested that you write to him relative to the price, etc."

Having read a great deal about this bullet in the Arms and The Man, also do a great deal of target shooting at the Fort Barry range with my Springfield, am very anxious to obtain a thousand of them for this purpose.

Would it be possible for you to order sent to me by express C. O. D. this quantity, for by so doing, if it is possible to purchase at all, it would save at least two weeks time.

I am at present using DuPont No. 16 powder and would like to know how much to load to obtain the 2,700 foot velocity with 170-gr. bullet.

Would you also please give information regarding the new powder which is being used and information regarding its purchase? O. K. H., San Francisco.

Answer: I have received your letter of July 13th, relative to the 170-grain 1921 National Match bullet. At present the entire output of these bullets is being put into the National Match ammunition, and none could be made available for sale until after the National Matches. If they are sold at that time, in accordance with regulations, the sale has to be made through the Director of Civilian Marksmanship to you as a member of the National Rifle Association.

It is not yet positively decided that this 170-grain tinned bullet will be made available for sale to members of the N. R. A. There are certain complications relative to loading which lead us to believe that the individual rifleman may not be able to successfully load it with hand tools. Just as soon as the National Matches are over I intend to investigate this matter fully and if I can devise a way in which it can be successfully loaded with hand tools, I will then recommend to the Ordnance Office that it be manufactured for sale to members of the National Rifle Association.

You could use DuPont No. 16 powder with it all right, using the same charge as with any other 170-grain bullet. The powder we now use with it is an experimental powder, known as DuPont EX-1076; the charge varying from 48.2 grains to 48.6 grains. This EX-1076 powder is an improved No. 15 powder. The DuPont Company have not yet put it out in canister lots, and it is doubtful whether they will do so because they seem to think that they can still further improve it and want to go on with their experimenting until they have arrived at a decision in the matter.

I HAVE a Krag rifle with barrel cut down to twenty-four inches fitted with Lyman receiver sight No. 34 and front No. 26. Also a Remington high-power No. 14R .32 cal. carbine. Which do you think would be the best for hunting deer and black bear?

Also kindly advise what you would consider the best cartridge to use in my Krag for this purpose.

J. H. D., Bayonne, N. J.

Answer: The Krag rifle is quite a little bit more powerful than the Remington high power No. 14-R Calibre .32 rifle. In addition, I have found that the trombone forearm of the Remington rifle rattles a little bit and makes the arm rather noisy for still hunting, but this latter rifle is really perfectly satisfactory for the purpose and is very good for hunting in thick timber, because the action is so very rapid and you can get in a second shot so quickly.

For the Krag rifle I would advise that you use the regular 220-grain soft point ammunition made by any of our leading cartridge manufacturers.

MAY the .30-06 cartridge be loaded (with safety) to give 3,000 f. s. when fired from a Springfield .03 rifle as desired? If so, what would be the powder charge? If not, what is the maximum charge advisable? Weight of bullet in all cases "Western" open point expanding 180 gr. proposed load for use on big game.

Aside from it being usually a success please give me a reliable formula for bluing gun barrels, one that if carried out accurately by one with some knowledge of chemistry and a good knowledge of mechanics, a fair job might be expected.

Kindly give a description or a rough sketch of a tool or tools used for checking gun stocks; also a brief description of their proper use.

How are steel parts checked, such as trigger, bolt handle, etc.? May this work be done correctly by an efficient tool maker?

Is a cast-off stock on a high-power hunting rifle an advantage to the experienced hunter? If so, how much cast off do you advise for the average above described individual?

Is the Ross Model 1910 .280 cal. rifle absolutely safe when the bolt is pushed forward as far as it will go?

Would you hesitate in recommending as to accuracy and killing power a high-grade pre-war 8 mm. Mauser rifle for the largest American game? The same of the Mannlicher-Schoenauer 9.5 mm.

May the 8 mm. Mauser cartridge loaded with 154 gr. expanding bullet suitable for hunting use be procured in U. S.? If so, from whom? Would not this be an excellent cartridge for deer?

J. L. M., Norristown, Pa.

Answer: The Cal. .30 Model 1906 cartridge cannot be loaded safely to give 3,000 f. s. when the 180-grain bullet is used. The maximum charge for the 180-grain flat base

bullet is 51.5 grains of DuPont No. 15 powder, which will give a muzzle velocity of 2,700 f. s., with a breech pressure of approximately 56,130 lbs. With such a charge it is absolutely essential to weigh each powder charge very accurately.

You will find full instructions for bluing barrels and for checking gun stocks, and a description of the proper tools to use, in my book, *The American Rifle*, which can be obtained from *Arms and The Man* for \$6.00. It would take ten to fifteen pages of typewriting to describe the processes so that you could surely do them without fail. The bluing formula given in my book, however, usually turns the barrel brown instead of blue, this depending a little upon the steel used. The following formula, however, almost always gives a blue color, and I would advise its being used instead of the formula in my book:

3 ounces Grain Alcohol.  
3 ounces Tincture ferric chloride.  
3 ounces sweet spirits of nitre,  
3 ounces bichloride of mercury.  
2 ounces sulphate of copper.  
1½ ounces nitric acid.  
2 quarts distilled water.

The checking of steel parts, such as trigger, bolt handle, etc., can be done with a sharp file or on a milling machine. Any toolmaker or machinist would have no trouble whatever with it.

A cast-off stock is desirable when a man is very muscular or stout, or has a very full face. About one-quarter inch at the heel and three-eighths inch at the toe is the usual cast-off.

The Ross Model 1910 .280 Calibre rifle is absolutely safe when the bolt is assembled correctly. However, on some of these rifles it is possible, after taking the bolt out of the rifle, to rotate the head of the bolt the wrong way so that when it is inserted and pushed fully forward the bolt head does not rotate and lock. This should always be watched for when the bolt is placed back in the rifle. Otherwise the bolt will be blown straight to the rear.

If your pre-war 8 mm. Mauser rifle is accurate, it should do excellent work on the largest American game. This also applies to the 9.5 mm. Mannlicher-Schoenauer.

As far as I know, no 154-grain expanding bullets have been made for the 8 mm. cartridge in this country.

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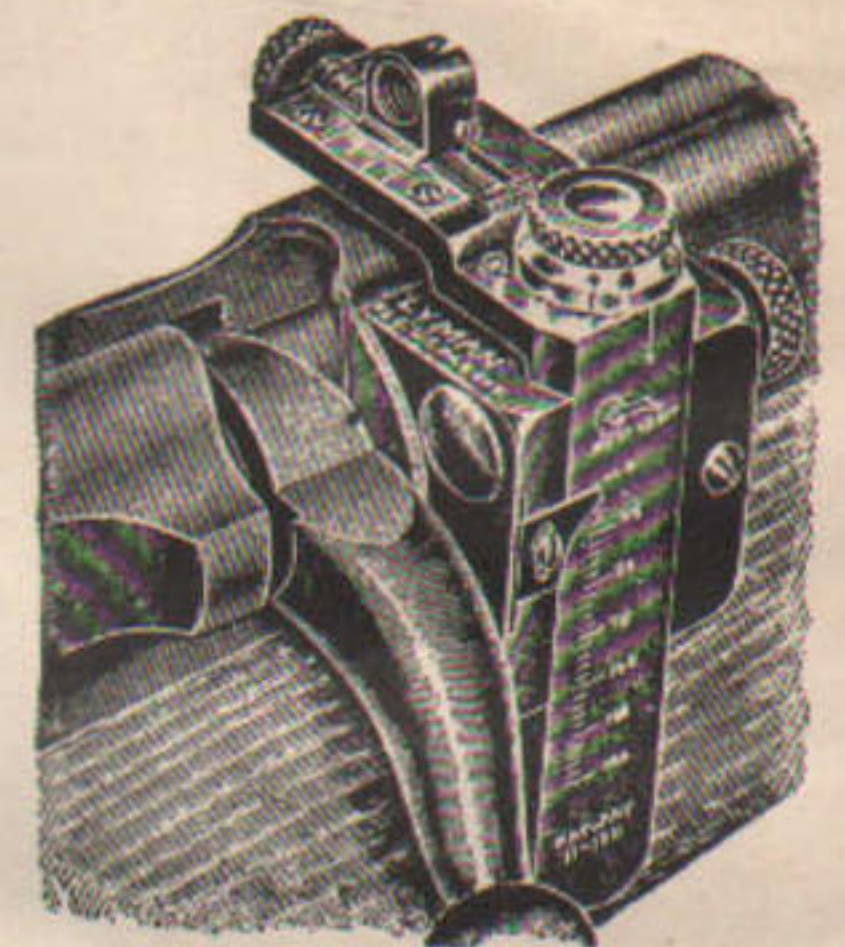
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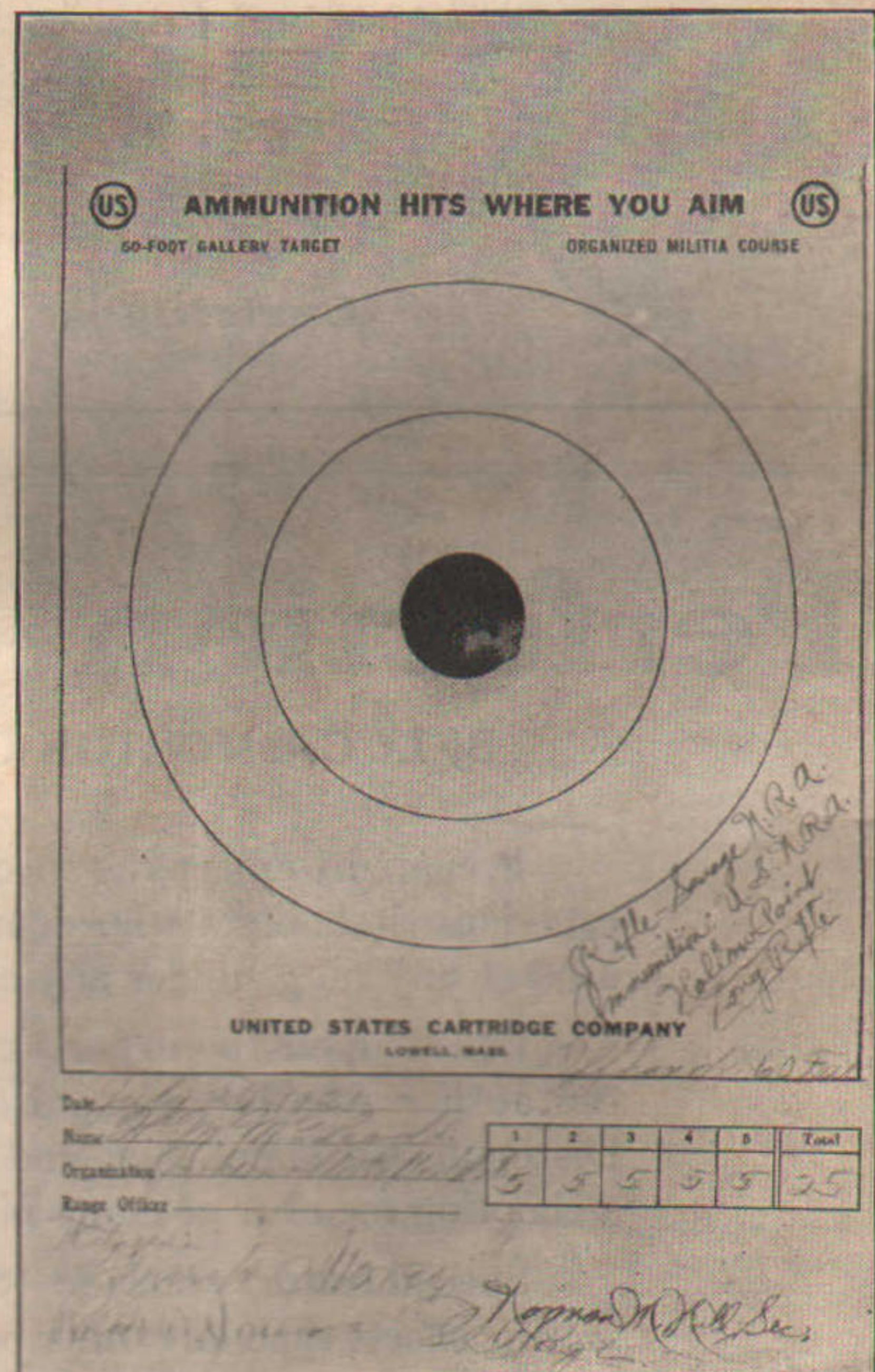
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## The Crack Shot Uses **US** Cartridges

He wants accuracy and sure-fire cartridges, but he knows that a fouled or pitted rifle barrel will throw even the best cartridge off enough to make the difference between winning and losing a match. All US Rim Fires, including the famous N. R. A. Long Rifle 22s, which have been used by the winners in so many contests, are made with a new priming that eliminates most of the fouling and wear in the barrel.

For the sake of your rifle use US Cartridges. They will add thousands of rounds to its life, and incidentally do all that ammunition can do to keep your marksmanship in the expert class.



Reproduction is  $\frac{3}{4}$  size of target shot at sixty feet by Hamilton M. McLeod of the Jacksonville Rifle Club on July 26, 1921, with US .22 N. R. A. Hollow-point cartridges.

# **US** CARTRIDGES AND SHELLS