RIFLE ARMS AND THE MAN

NATIONAL RIFLE ASSOCIATION OF AMERICA

PUTTING A FRIEND IN PLACE

SMALL-BORE SHOOTING IN ENGLAND
Part 2

TARGET TIPS FROM THE OLD TIMERS

SOME CURRENT NOTES ON THE .22

EDITORIALS and

THE LATEST NEWS OF RIFLE, REVOLVER AND SHOTGUN; THE ARMY, NAVY AND THE NATIONAL GUARD

VOL. LXVII, No. 9

NRA

NOVEMBER 22, 1919

Peters

Semi-Smokeless

Cartridges

For Revolver and Rifle

The past performances of PETERS CARTRIDGES in important rifle and revolver competitions can not be overlooked by those who consider **results** the real proof of ammunition superiority.

PETERS CARTRIDGES loaded with Semi-smokeless powder have been used by experts simply because they have been found more accurate and uniform.

In addition to these important qualities the remarkable cleanliness of Semi-smokeless powder is appreciated by everyone. A glance through the barrel after a number of shots have been fired will tell the story, and the ease with which the very slight residue is removed will show you why PETERS Semi-smokeless Cartridges are famous for their cleanliness as well as their accuracy. They cost no more than ordinary black powder cartridges.

No other make of cartridges are supplied with Semi-smokeless powder.

PETERS CARTRIDGES offer the maximum of satisfactory service

THE PETERS CARTRIDGE COMPANY, Cincinnati, Ohio

***Branches*—NEW YORK: 60-62 Warren Street** **SAN FRANCISCO: 585-587 Howard Street**

Issued October 4, 1919 — Latest Work on the Subject

FARROW'S MANUAL OF MILITARY TRAINING

BY

EDWARD S. FARROW

Late Assistant Instructor of Tactics, at the United States Military Academy, West Point, New York

Author of Farrow's Military Encyclopedia, American Small Arms, Farrow's Dictionary of Military Terms, Riots and Riot Duty, etc.

A NEW book, covering the entire Art and Science of War, which is keyed closely to the spirit and need of the times. As shown in the following detailed Contents of Chapters, it is quite as useful for the Commanding General as for the ambitious private or non-commissioned officer, as it embraces all the War Department Manuals, Bulletins and Publications of the General Staff. The work is the ripe product of extensive specialization, finding its culmination in a survey of the great European War. It should have a strong appeal to the Military Service, Military Schools, Military Writers, Students, Editors, Librarians and careful readers. It occupies a large and important field distinctively its own.

PASSED BY THE WAR DEPARTMENT AUTHORITIES

1034 pages, illustrated, printed on Bible paper and bound in full flexible fabrikoid, gilt edges, round corners, pocket-book style. Measurement 4¼ x 7 inches.
Price $4.00, by mail $4.10.

SHOULD BE IN EVERY LIBRARY

SCIENTIFIC AMERICAN PUBLISHING CO.
236 Broadway, New York

DISTINCTIVELY

The .22 Match Rifle of Today!

Captain Wotkyns won the Small-Bore National Individual Match, 22 shots, 50 and 100 yards, against a field of 70 of the best shots of America, with the B. S. A., with a score of 392 ex 400, and later put on the top score in the International Match of America and Great Britain, viz: 391 at the same distances and the same conditions.

The Great U. S. A. Caldwell Meeting attended by thousands of U. S. A. marksmen, demonstrated conclusively that the B. S. A. is the best rifle produced for short range match shooting.

Illustrated particulars of this incomparable match rifle sent post free on application.

Showing the take down feature which makes for great convenience in cleaning and transport. The taper pin shown, forces the barrel into exact position every time. Another pin holds the detachable action in place.

The Birmingham Small Arms Co. Ltd.
Birmingham, England

ARMS AND THE MAN

The Official Organ of the National Rifle Association of America

Volume LXVII, No. 9 WASHINGTON, D. C., November 22, 1919 $3.00 a Year. 10 Cents a Copy

Putting a Friend in Place

JOHN LYNN

CAN a man use reduced loads extensively in his hunting rifle without impairing his skill with full-power ammunition? There are several things to be said on both sides of this question that a casual consideration does not bring out. Anyone who prides himself on his ability to stop his game will do well to avoid certain pitfalls that will be named.

The first difficulty that appears is the lower point of impact of the reduced load bullet. In the Springfield .30-06 cartridge, for instance, 12 grains of No. 75 smokeless powder will throw almost any suitable bullet, such as the 150-grain service one or Ideal No. 308241 (a popular and efficient combination), 6 or 8 inches lower than service ammunition with the same sight adjustment. Bullet groups made by the light load also are likely to be 1 to 3 inches off to a side. In medium-calibre hunting rifles, such as the .30-30, .25-35, .303 Savage and .35 Remington, all reduced loads perform in much the same way.

At first glance a complete and easy remedy seems to be in adjusting the sights. What is simpler, for example, than raising the Springfield sight to 550 yards, with one or two points left windage, as the rifle may require, and plugging the light-load bullets to the exact center?

Sights must be so adjusted, but when they are, the finely adjusted skill of the man is disturbed. The first few times afterward that the rifle is thrown to the face, the rear sight blots out the view—the eye is accustomed to cuddling down close. Presently, however, the man learns to cuddle a little less. The sight is about a quarter of an inch higher, therefore, one joint of the man's neck is unlimbered slightly, and his eye gradually accustoms itself to new elevation above the stock. The result is excellent. A heavy hunting rifle becomes a wonderful sparrow gun. The man can pick out their eyes.

The next week he goes to camp in the big-game country, and on the way in pulls down on a little spike buck that has not yet learned the dangers of trotting by the trail, this time, of course, with the gun full of heavy ammunition. For some unholy reason, the front sight sticks up, its head a quarter of an inch above the rear sight. It hangs there as though held by a wire from above. He pulls the trigger, anyhow. The bullet bites a chunk out of a hemlock tree a foot above the buck's back.

This statement describes an actual happening observed last fall. It serves to illustrate that the best woods shot is a man accustomed to using only one gun, and, if possible, only one sight adjustment. The cheek and arms learn a certain related elevation with relation to the stock. When measurements are changed, even a quarter of an inch, snap shooting finds the aiming eye hopelessly jammed off the line. To switch from one eye position to another is impossible without considerable practice in the new position. It would seem that the man who mixes his kinds of ammunition might be eliminating himself from the class of good woods shots, yet there are other considerations.

Closely related are the range and the trajectory of the cartridge and rifle. Anyone who shoots with a single combination of load and gun acquires a fine sense of how far the bullet will go and how much it will fall at any particular distance. It is nothing unusual to find a man with a .38-40 who can "drop" a bullet at 300 yards into an 18-inch circle a remarkable number of times out of ten. His bullets fall 10 feet or so at this range, and lack close grouping capacity, at that. Users of .22 long rifles also become skillful at estimating fall and range. It is crystallized observation that enables them to do it.

The man who shoots many reduced loads in his big rifle at more than 25 or 30 yards will acquire a false sense of bullet fall that will cause overshooting with full-power ammunition. It becomes second nature to push the front sight up on an object whenever the distance is 50 yards or more. As a result (for a second reason), the man overshoots, although he may never before have identified the reasons. To counteract such tendency, it is necessary to take certain definite steps, which will be explained.

When the range is more than 100 yards and beyond, the reduced load, of course, is badly handicapped by its trajectory unless its elevations have been worked out and marked on the sight. It is in this connection, perhaps, that the greatest harm is done to skill with the full-power ammunition. A man gets to limiting his range. If he uses a sporting Springfield or a '95 Winchester, for instance, it is no trick to hit the 8-inch black at 300 yards on the range five times in ten shots, and not rarely six or seven times. Why, then, should opportunities at turkey, deer and bear at such a range or even at 200 yards be passed up or regarded as slim chances, as they are by many good hunters? Confidence based on known regularity of performance is one of the hardest things to acquire in rifle shooting—the real article is meant here, not the flash kind that accompanies the dude sport the minute he steps away from the gun counter with his new rifle. A limiting idea of one's honest ability to hit at long range is hard to train away from. It persists for years. The reduced load propagates it, while it is killed only by special work directed toward that end with regular ammunition.

Of lesser importance are the differences in velocity. More "lead" is required on running game with the light load. This feature of the matter would cause more trouble were it not for the fact that full-power ammunition is used largely for big game at distances of 100 yards or longer, while reduced loads are used largely for small game within 50 yards. The increased lead necessary on account of low velocity in the latter case, in some respects compares to

the increased lead required by distance in the former. What the difference between low and high velocity amounts to, however, can be demonstrated strikingly by shooting at tin cans in the air. The average man who is not practiced at this, but who is thoroughly familiar with his rifle, will miss the cans with light loads and hit them with full loads. The faster bullets get to the cans quicker.

In this same connection wind drift must be remembered. The best plan is to avoid acquiring a sense of the drift of the reduced load, as well as of its lead on moving targets, by avoiding practice at ranges longer than 50 yards. Two hundred yards practice on moving targets with reduced loads is bad medicine for any one who shoots in the woods with regular ammunition. The false lessons learned will stick by one like a burdock burr.

Recoil of full power ammunition bothers many hunters who have short-stocked rifles. The best remedy is a 13 3-4 or 14-inch stock. Reduced loads sometimes teach a tight, close holding that later on brings the shooter's nose too near his thumb or the hammer on the rear peep sight of his rifle when the other cartridges are used. Recoil, however, is a thing not greatly noticed, as a rule, in the woods. Gun shy men are afraid of their imagination, not of the actual kick they get. When one has a tendency to flinch, the use of reduced loads is just exactly the medicine he needs, as it shows there is no chance of getting hurt. After a hundred or more light charges have been fired a man can keep his eye right to the line when letting off full-power stuff.

Reduced loads can be harder on the barrel than full-power loads. although the popular notion is directly to the contrary. Bullet wear does not cause the trouble. So far as bullet wear is concerned the cast bullets can be fired from a barrel almost without limit before the barrel shows wear, while a few thousand metal-cased bullets undoubtedly do wear down the lands. It is the *corrosive* qualities of the powder gases and powder ashes that causes the trouble. A reduced load seldom develops pressure enough to burn the powder as completely as full charges. Unburned grains can be seen along the bore after a shot.

The residue of the powder and of the primer acids which stays in the barrel eats the steel unless the greatest care is taken to clean with ammonia or nutralizing agencies. This need most riflemen do not understand. They proceed under the supposition that thorough cleaning is needed after shooting full power ammunition, but that a greasy rag perhaps is enough after reduced-load shooting. The result, of course, is a badly pitted bore, which ruins that barrel for fine work.

To summarize, these six difficulties mentioned will be encountered by the man who used reduced loads—the new line of sight required will cause the eye to lose itself; trajectory and bullet fall are much more than usual; bullet range is limited so much that long shots are impracticable without first having targeted the rifle; more head-lead is required on moving objects because the velocity is less; recoil being a mere throb, the normal kick when next to experienced may surprise the shooter, and, finally, more care is necessary to prevent the bore from pitting. The list is impressive. A few shooters, whose pocketbooks are long, or who, for one reason or another use few cartridges, probably had better shy off—sticking wholly to factory full power ammunition.

The great majority of shooters, however, find the advantages of using reduced loads to outweigh their disadvantages. One point gained is that reduced loads do not tear small game as full-power loads do. Rabbits, squirrels, turkeys and other such game are shot with almost every deer and bear rifle. The satisfaction of doing the job neatly, without waste of meat, is worth some effort. Even the government used to furnish reduced ammunition for the 45-70 rifle for use in killing small game.

The primary reason for using reduced loads always will be to get more shooting than is possible if factory ammunition must be sought—to save money and to give the quantity of practice necessary for developing skill. A man can fire several thousand cartridges a year with reduced loads without re*quiring a new barrel each season.* He still has his old gun without change. He can rely on the well-learned muscle movements and on the feel and shape of his stock, forearm and trigger.

It is almost essential that a hunting rifle be equipped with better sights than the factories furnish when other than factory ammunition is used. Windgauge adjustments are necessary. These better sights are worth all they cost for use with the regular ammunition, hence, should not be charged altogether to the shooting with reduced ammunition. A bolt rifle is better than a lever gun when reloading is to be done because in it shells do not expand so much. The bolt locks support the cartridge close to its head instead of several inches back. There is chance for little spring or stretch in the metal. The bolt permits cleaning from the breech, which is a big thing where so much cleaning must be done.

The way to avoid the inevitable confusion of the eye in getting a quick sight is to shoot with reduced loads enough actually to develop some skill—until the feel of trigger, butt plate, comb and forearm are second nature. It takes about a thousand shots to give the average man this familiarity. Then, a few weeks before going on a big game hunt, lay reduced ammunition wholly aside, and shoot about a hundred full-power cartridges with care. Fire them at ranges up to 500 yards. Shoot at all colors and sizes of targets, including some moving ones, if possible. Also throw the gun to the face frequently and aim without shooting. The lower and more central position of the rear sight will normalize itself to the eye and cheek, with the result that the reduced load adjustment will be the one that seems awkward.

After regular sight adjustment is restored, take your reduced ammunition along to the woods, but use it sparingly. Avoid carrying the gun with sights set for it. Nearly always when a light cartridge is demanded there is time to change the sight. What quick shots are needed can be fired by holding over. The rifle then works according to your original intention—as a powerful, long-range gun, with which an occasional low-power shot is available by means of a little manipulation.

If the use of the low and high-power ammunition is confused, unaccountable misses will be made, and the rifle likely condemned or the shooter will conclude he is getting too old for hunting, which is a bad conclusion for any one to reach. Habit is a strong thing in shooting. Great care should be taken to form only those customs of movement and thought that are absolutely right. The conception that finds lodgment in the head of the hunter of the looks of the sights and of the flight of the bullet used, is what will aim and pull the quick shots on game. Rightly used, the reduced ammunition provides training and skill which can be rather easily switched over to the use of the full-power ammunition. The reduced stuff then is retired except for the small meat shots now and then, for which it is indispensable.

ANTI-PISTOL LAWS.

Capt. G. E. Cook gives this warning against anti-pistol laws in the current issue of *The U. S. R. A. Bulletin:*

Many cunningly devised "strike" gun bills are now before our legislatures. Help urge our honest lawmakers to reason before they vote to accept them.

Because "Sullivan laws" disarm only the law-abiding.

Because criminals will always use arms for the sake of the advantage it gives them over the law-abiding.

Because the criminal cannot be disarmed by merely passing a law.

Because if he can make burglar tools he can make firearms or smuggle them.

Because the pistol in the home is the only thing that equalizes the chances of a woman, an old man, an invalid or the feeble with the husky thug.

Because the automobile has made it easier for the criminal to reach his quarry and to make his escape.

Because the rural districts can never have adequate police protection.

Because it is not the flimsy catch on the window or the simple lock on the door that protects half so much as the fear of a gun in the house and a hand that can use it.

Because upon a householder often devolves the defense of the household.

Because the pistol is the primary school for the rifle and with it the man that would never get an opportunity to handle that military arm can acquire the rudiments of holding sights and sighting, the all-essential of how to pull, the better able to protect himself and a more valuable potential defender of his country.

Small-Bore Shooting in England

(Part II)

By HENRY WALTER FRY

THE next event in the club's history was the holding on its range of annual rifle shoot of the Society of Miniature Rifle Clubs, which took place in the first week in September. This necessitated the putting in of a 100-yard target butt, as some of the competitions were to be shot off at that distance. So the 50-yard butt, which had stood close up against the railway embankment, was moved over to the left, and the new 100-yard butt duly set up. The meeting was successfully held, and for the first time we had the chance of trying out the .22 rifle at a distance twice as great as that at which we had up to then used as our longest range. It did not take us long to get accustomed to the new distance, and for our best shots to be making scores away up in the high nineties, in spite of the shooting expert of one great sporting journal, who had declared that 25 yards was the maximum accurate range for the long-rifle cartridge, and the dictum of another, whose experience was chiefly confined to the .303 service rifle, who was a little more generous and had allowed that 50 yards was the farthest distance at which the .22 could be expected to perform consistently. The new arrangement of butts remained unaltered for the rest of the time of the club's existence.

Our use of the aperture sight on the smallbore rifle did not by any means pass unchallenged in the first years of the club's history. It was fiercely opposed by the two other clubs in the locality, who upheld the open sight as being the nearest in resemblance to the sights on the military rifle. Certainly it seems on the face of it perfectly obvious and incontestable that a man should practice in peace with the sights he is called on to use in war and that the more your practice rifle resembles your fighting tool, the better. Large numbers of people believe the same thing in this country today and hold that a bolt action is the best for a .22 target rifle, as it would accustom its users to the use of the bolt action of the military gun. I do not agree with them and will not deal with that question just yet, more than to intimate that they, too, are the bond slaves of the obvious. I once waded through a very dull and prosy volume of German Court Memories, which was as stupid and uninteresting as all memoirs of courts and royalty are, but was amply repaid for hours of boredom by one saying which I have never forgotten. How the author came to evolve such a jewel of wisdom is a mystery; he must have cribbed it from someone; he never could have evolved it from his own inner consciousness, as the German professor is said to have evolved a picture of a camel. The saying runs something like this, "It is safe to assume as an axiom that in politics and also in most other things the truth is never obvious. Whenever a theory or contention seems so absolutely logical and incontrovertable that its correctness appears self-evident, it is time to approach it with the utmost caution and to treat it with the most severe distrust and the most relentless scepticisms." Our local friends who belonged to the other two clubs had never grasped this fundamental truth. One club carried its disbelief so far as to refuse to use the smallbore rifle at all and did their indoor shooting with the full-size .303 rifle and cartridges loaded with a reduced charge of powder and nickel-base lead bullet, regardless of the facts that their ammunition was twice as costly as ours, was not as accurate at 25 yards, and of no use at all beyond it, and that on an indoor, artificially lit range most men found that it was impossible to take accurate aim with military sights unless aided by such unmilitary accessories as orthoptic spectacles. I have never seen them in use on any rifle range in this country, though in England, in the days when the use of open sights was compulsory in matches with the military rifle, nearly all the best shots used them. A pair of orthoptic spectacles is one in which the glass lens in front of the right eye is replaced by an opaque black disc pierced with a small hole, which cuts off a certain proportion of light and sharpens up the definition of the sights. In target shooting by artificial light very few men could do any good at all without them, and yet some of these very men used to pride themselves on being practical military shooters and denounced us for using .22 rifles and aperture sights, calling them "toy rifles" and "popguns" and our sights "impractical," "artificial," "unmilitary," and various other pleasing epithets.

Tremendous paper battles used to be waged on the sight question in the columns of the local paper, which reported the results of our weekly shoots, the trenchant pen of Mr. Newitt doing yeoman service in the cause of the aperture sight. I even once took a hand in the fray myself and wrote a letter attacking the methods of one of the rival clubs. It was, no doubt, a very crude production; but I considered it a masterpiece of scathing sarcasm at the time. It is all very funny to look back upon, now that the peep sight has come to stay, but we took it very seriously in those days. The thing that did as much as anything to open the eyes of the smallbore shooting world to the virtues of the peep sight was a series of open rifle matches held in various parts of Great Britain, open to any rifle of not more than .23 calibre and any sights not containing glass. The Southfields Club sent teams to all these matches, and as they were the only ones using rifles with aperture sights, they cleaned up nearly all the prizes. Men who were using open-sighted .22-calibre rifles or service rifles with Morris tubes simply didn't have a look-in. The Morris tube, by the way, is a device that not many American riflemen are familiar with. It is simply a rifled steel tube, .23 calibre, which is put into a military rifle from the breech end and secured by a brass nut screwed hard against the muzzle. It is chambered for special central-fire, bottle-necked cartridges, the .297-.230 short, with 3 grains of powder, a beeswax wad, and a 38-grain bullet, and the .297-.230 long, with 5 grains of powder, a beeswax lubricating wad, and a 38-grain bullet, almost exactly the same load as the .22 long rifle and in theory a much better designed cartridge. But it never shot as well, even in rifles specially bored and chambered for it, though it was better than the .297-.230 short, which was most unreliable. I have seen a man start to make a good group with it and then a shot would go wide and keyhole. When he appealed to me for sympathy, I told him it served him right for using such stuff in his gun. With the .297-.230 long the Morris tube would shoot pretty well so long as it was kept screwed up tight in the rifle, but if the securing nut at the muzzle got loose and the tube turned around, it would entirely alter the shooting. So some men would put the tube into an old barrel and secure it by pouring melted lead in around it, which certainly kept it in place and made it give consistent shooting with the long cartridge, but not equal to the .22 long rifle.

The continued success of the Southfields men at these various rifle matches naturally aroused interest and curiosity as to their methods. Our men made no attempt to hide the reasons for their success, and preached the virtues of the .22 long rifle cartridge and the aperture sight wherever they went, with the result that other clubs began to adopt our methods, and it was not long before some of them became very formidable rivals to ourselves. To us this was a matter of sincere rejoicing, for though of course we liked to win matches, we didn't mind being beaten if it was done by methods that we had taught our opponents and which we felt were sure to promote the welfare of the whole of the miniature rifle club movement generally. When the year 1905 drew to a close, we felt that the club and the rifle club movement, too, had good reason to congratulate themselves on the progress that had been made. The club had by this time settled down to the methods which it had found to give the best results. All the regular shooting members had acquired aperture-sighted rifles and telescopes, and the old club rifles had almost fallen into disuse. Our contention was that a member of a rifle club provides himself with a rifle as naturally as a member of a tennis club buys and uses his own tennis racket, and that, generally speaking, club rifles are a mistake, it being no one's special interest or business to keep them in good order or record their elevators for the different distances. The black and white decimal target was used at all three ranges, and for some competitions, more especially for rapid-fire work, a green target, with a khaki-colored head and shoulders in the center, was adopted. No markers were employed; all spot-

(*Continued on page 164*)

Target Tips From The "Old Timers"

A score of years ago, when high-power rifles were in their infancy, such men as "Ralph Greenwood," the pen-name used by A. C. Gould, Ruben Harwood, a Massachusetts gunsmith and rifle enthusiast who wrote over the signatures of "Aberdeen," "Iron Ramrod" and "Ab R. Deen," Horace Kephart and E. A. Leopard experimented widely and put on record the knowledge thus gained. For the benefit of those who are unfamiliar with the work of these authors, and at the request of many subscribers, Arms and The Man will reprint the best of their contributions.

Hints For Amateur Mechanics

By "TRIM NAT"

WHILE many amateurs are possessed of engine lathes, very few are aware that they have the means therein of producing flat surfaces at any angles, or on almost any shaped piece of work, their resource generally being to filing or getting the flat parts milled or planed elsewhere. Many articles from their peculiar shape or fragile form are considered impossible to hold without special chucks, jigs, or other fixtures, and as these may often be beyond the ability or the financial reach of the amateur, the work is often abandoned for those reasons. Nearly all flat surfaces whose limits are not bounded by uprising parts may be machined on the engine lathe at an outlay of time and labor so small that many may be inclined to doubt the fact, even after I have stated it; yet it is entirely practicable, and hardly a week passes that I do not use the method in preference to other means, simply because I can produce the work better and at less cost; also, in many cases because from the nature of the work it is almost impossible to hold it in any other way.

The materials needed are a plain cast-iron face-plate and some plaster of paris, that is all; no bolts, chucks or angle-plates required. The face-plate should not have any holes, slots, or protuberances on it; simply a plain plate, and is best made of as large diameter as the lathe will swing. It should be turned perfectly true on the face, and with the edge or rim, square with the face, just the same as any ordinary face-plate. No attempt at polish should be made, as that is a detriment to the working of the method. The hole in the hub, where the nose of the spindle screws in, should not go through to the face, but the face must be entire with one exception; that is, a small hole in the exact center of the plate and is best for general use if made one-quarter inch in diameter. Place the face-plate on the spindle and drill and ream out the hole perfectly true and central; if the drill is inclined to run untrue, then use a smaller one and finish the hole to size with a small boring tool, held in the lathe carriage. As this hole is for a stud or center, from which to true the work, the necessity of having the hole dead true will be seen. This face-plate must be kept free from all oil or grease. Rust or stains will not affect it and it does not need a smooth surface—only a true one free from grease. Sandpaper is best to scour it with, and coarse at that; emery cloth is not so good.

Now, we will suppose we have a dozen castings, one inch square, and which we want machined on all six sides to, say, seven-eighths-inch cube. Snag or clean the castings with a file, just enough to remove the sand and the pin points. Lay the face-plate on the bench, face up; place the dozen castings in a ring on the plate at equal distances from the center or nearly so and not any nearer together than one-eighth inch, seeing at the same time that they rest fairly solid on the plate. Get an old tin can or something to mix the plaster in. This must be free from all grease. A discarded tablespoon is the best thing to mix the plaster with. In the can put about a pint of clean water and add the plaster by sifting it in, stirring all the while until it is free from all lumps and of the consistency of a batter, neither too thick nor too thin. This is important, as if too thin it will not set quickly nor hold well to the plate. Having mixed it about right, slush it around the pieces of castings, building a wall around them as it were nearly to the top and working the plaster in between them with the point of the spoon. Hold the castings down on the plate with the thumb and fingers of the left hand, while with the right hand the spoon is used. The plaster wall need not be over one inch wide at the top—less will do—and let it taper down to the plate at an angle of about forty-five degrees. The important points to remember are, the grease must be removed from all articles or else the plaster will not stick; the mixing and application needs to be done rapidly, as plaster will set very quickly. The mixing must be about right, or else the plaster will be either too thick or too thin. It only requires a little practice for any one who has never used the plaster, and once applied properly is easily remembered another time. Do not jar the plate while the plaster is setting and be sure to get it into good contact with the plate and the castings, avoiding all loose dirt and chips. While the plaster is setting, trim the plaster away to one-eighth inch below the top of the castings with an old chisel or knife and smooth off all jutting edges, taking care not to jar or loosen the plaster.

The placing of castings, mixing, application and trimming of the plaster will probably take ten minutes. Set the plate, if possible, in a current of warm air that the moisture may evaporate quickly. Sometimes in half an hour the plaster will set hard enough to work with, but much depends on having good fresh plaster and the subsequent mixing and quick application. I have begun to work on a job sometimes as soon as I got it trimmed.

In grinding the cutting tools, have them without hook and the width of the point very narrow—not much wider, in fact, than the rate of the feed, say, about one-thirty-second inch wide. Use a steady feed and not too deep a cut, especially on the roughing cut. It must be remembered that jarring or hammering will loosen the plaster, yet the tool passes from one casting to another without loosening the work at all, provided the preliminaries have all been well done. For the finish cut set the tool from a clean spot on the plate and use a light cut, of course, to finish with. When one side is finished, take the face-plate off and lay it on the bench, face up. With a wooden mallet strike on the back of the plate until the plaster comes loose from the plate, slowly turning the plate round while striking it. Clean the plate, scrub it off with sandpaper to the iron, put the finished and clean sides of the castings down into the plate and repeat the foregoing operation to finish the second side, bringing the thickness to the seven-eighths inch. required. Break them off and clean the plate as before. Now, in placing for the next cut, place a square or square block on the plate, place one of the castings up against it to square it, and, having the plaster mixed, place a quantity of it on three sides of the castings. Quickly placing another casting in position as before, about one-fourth inch away from it, pack the plaster between the two and on outside and inside as before. Repeat until all are squarely set, keeping them as nearly in a circle as possible. Proceeding in this manner, it is apparent that the dozen cubes will be quickly finished, without at all marring their surfaces, which would be apt to be done if held in usual manner for planing or milling.

Slender articles, which will not stand fastening in the usual way without being distorted, can by this method be held firmly without fear of any injury resulting. They can be on the edge of the plate if nececsary and can be milled, drilled or otherwise worked. It is astonishing how firmly they are held and beginners always show a lack of faith in the method, but as soon as they get the knack they prove ardent advocates and can easily hustle a job along. As a rule, the great fault with beginners is that they mix the plaster too thin—get too much moisture in it—and apply it too slowly. It will not do to mix it thin and stir it until it thickens; it must be mixed and applied as quickly as possible.

At a pinch, a good dry cherry face plate, one free from varnish or grease, will do if

(Continued bottom page 163)

ARMS AND THE MAN

1111 WOODWARD BUILDING, WASHINGTON, D. C.

EVERY SATURDAY

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 a 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.

RECOGNITION FOR THE RIFLE.

THE report of the Chief of Staff to the Secretary of War on matters pertaining to the future training of the United States Army in marksmanship is a full and gratifying recognition of the soundness of the theory that the rifle is pre-eminently the weapon of the soldier, and that the fighting man cannot properly be trained without skilled instructors.

If the report of the Chief of Staff can be taken as an indication of the future policy of the War Department, it would appear that the friends of rifle practice will in the near future have the support of the highest ranking army officials in their efforts to bring about legislation which will insure the speedy completion of training centers such as the one which is now under way at Camp Benning, near Columbus, Ga., and the use of these centers for the purposes for which they were planned.

That part of the report of the Chief of Staff which is devoted directly to the consideration of rifle practice and to placing on record the conclusions which the War Department has arrived at as the result of the war with Germany reads:

"The war with Germany has in no way decreased the importance of the rifle and rifle training. The rifle is still the premier weapon of the soldier. All men armed with the rifle and all replacements should be trained to effective use of the rifle.

"Proper training in rifle firing requires skilled instructors. A system for producing skilled instructors, and the best methods of training the individual, must be developed. This system and these methods must be uniform throughout the Army for all organizations and replacements alike. The most efficient method of assuring this is to train at a central school a large number of instructors who, upon joining their organizations, can be utilized to insure proper and uniform methods of training.

"One important lesson of the war with Germany was the need of trained officers to act as instructors, and an appreciation of the time and facilities necessary for their training. For the training of large numbers of Infantry officers in technique (which includes marksmanship) and in tactics (which includes musketry) a plant such as was, on the signing of the armistice, under development at Camp Benning must be provided."

HINTS FOR AMATEUR MECHANICS.

(*Continued from page 162*)

turned off true and not used too long at one time. The trouble is that the wood holds the moisture and in drying it tends to draw away or separate from the plaster. Of course, the harder the metal being machined the lighter the cuts need be; discretion must be used as in all other methods of holding, but there are many cases where heavier cuts can be taken on certain parts of articles than could be taken if held in any other way. Different modes of application will quickly suggest themselves to every thoughtful mind, for they are well-nigh unlimited. Round, half-round, triangular, conical or multisided articles are all held without trouble. I have gone into minute details about it, not because the method is complex or difficult to learn, but rather for the purpose of making it all clear at the start, the whole matter being so extremely simple and thoroughly practical that it always creates a surprise whenever shown in operation.

Quite often the mechanic wishes to make some metal pattern in halves, the object being to get castings from the pattern. Face up the two sides which come together in the center, wet them with soldering acid and tin them with solder and a soldering iron. Wipe off all but a thin coat and place them together with the faces well wet with the acid. Apply the flame of a Bunsen gas burner or a forge fire until the solder begins to ooze out at the edges; do not hurry it in heating, and it may be needed to touch the stick of solder to the joint, at the time the solder begins to run. The piece in question, must of course, be of such metal as takes solder readily. When cool it can be turned or otherwise machined into the shape desired, and then on being heated again the halves will come apart. If the article is intended for a pattern, drill the dowel pin holes before melting it apart, else it will be somewhat difficult to locate the parts in proper register again.

The proper soldering acid is made as follows: Put four ounces of hydrochloric acid, commonly known as muriatic acid, in an open vessel of glass or crockery ware. To this add, in small pieces, as much zinc as the acid will eat up and leave a little surplus; this will generate great heat, which is the reason for leaving the vessel open until the liquid has had time to cool after eating up the zinc. When the zinc is dissolved the acid has become muriate of zinc. To this add one-half ounce of sal ammoniac and dilute the whole with two-thirds its bulk in water. It is then ready for use.

To tin a soldering copper, heat it to a degree that will instantly melt the solder, quickly file the oxide off with a coarse file, dip it in the acid and touch the solder stick to it, when the surface will be instantly coated with the solder. In this condition the copper will readily pick up drops of solder and carry them to the work. Do not get the copper overheated, and dip it in the acid after heating each time.

When marking working lines on metals, such as iron. steel or brass, it is best to put a thin copper coating on, for then the bright line made by the scratch-awl is made more prominent by the contrasting color. To one ounce of clean water add all the sulphate of copper it will dissolve, or more. If the surphate is well pulverized it will more readily dissolve. When it is dissolved add five drops of strong sulphuric acid and it is ready for use. To use, clean the surface of the work bright and free from all grease, shake the copper solution and apply a little of it on some clean waste or a stick. It should instantly coat with the copper, but if it does not it is because the surface is not clean enough. This will serve on steel or iron, but on brass or copper, bath must be applied by a strip of clean bright steel, otherwise the solution will not deposit the copper. This lat

ter trick is one with which few mechanics are acquainted. It makes a much better color than the brass to draw lines on. The solution must be rubbed on with the steel until the deposit takes place, which will not be long.

Handy filing blocks for use at the vise consist of hardwood blocks, drilled through with a row of holes in varying sizes and at different angles; connect these holes with a saw cut; now when a rod is placed in a hole of the proper size and the block clamped between the vise jaws the rod will be held firmly for filing, drilling, tapping or other work, without marring the work. V-shaped grooves on the side of suitable blocks are also useful.

Short pieces of file are often handy to get down into a recess or some out-of-the-way place; these can be made by breaking a file into the proper length, grinding the ends as required; clean the file well with hot soda solution and wash well in clean water. Now file one end of a brass rod at the proper angle to serve as a handle, moisten the filed end of the rod and side or edge of the file with soldering acid and tin them both; place the rod in position on the file and with a hot soldering copper solder them together. These are known as file stubs—not Stubs' files, which are quite a different thing. For all ordinary uses these stubs will answer as well as the trade-made tool, and are much cheaper.

When done using files, or, indeed any tools that are likely to be damaged, do not throw them into a drawer or allow them to lie in contact. Suitable leather loops or racks will keep the edges from being damaged and preserve the temper of the user. Tools that are worth using are worth taking care of.

As a rule, files that are dry and free from oil will cut better, but for fine finishing, as before described, oil can be used to advantage. If an oily file is used on cast iron, the surface will glaze over and most of the other metals will clog up the file teeth. Filling the file teeth with chalk, as described, will prevent the clogging, and can be used on all metals. New files are quite often smeared with oil by the makers to prevent rusting. This can easily be removed if desired by washing them in a strong solution of washing soda.

A can or kettle of soda solution is a handy thing in any workroom. The solution should be strong and if it can be heated, so much the better. A strainer of wire netting, hung at the top of the kettle, will aid in getting the work out. Tools, such as taps, dies, etc., or work which is full of greasy chips, will come out of it nice and clean, the soda cutting the grease all off; a hot solution works much quicker and the washed articles will soon dry. Soda water is a good lubricant when turning soft steel, iron, copper or babbitt metal. It causes the tool to cut smoother and cools it. As a bath for hardening steel, clean soda solution is very good, the articles having less tendency to rust afterward.

As a rule, all steel and wrought iron will turn well in the lathe when dry, but for drilling, tapping, reaming or milling, oil should be used. These operations require a good quality of oil, and the best is what is known to the trade as winter-bleached sperm; for the second choice use the best grade of lard oil. These oils are not the cheapest to buy, but as they do much better work and can be used more sparingly, they are the cheapest in the end. Copper, babbitt and like metals can be drilled, reamed and tapped out best with a mixture of one-third crude petroleum and two-thirds lard oil.

For riveting always use a light hammer, while for driving or forging use a heavy one. One well directed blow from a heavy hammer will drive out a pin and not injure it much, while the repeated blows of a light hammer would only batter it out of shape. For work that must not be bruised or otherwise injured, a lead hammer is best; this is simply a slug of lead with a hole through it for the handle. I use them without any handle; just a slug of lead about four inches long and one and one-quarter inches in diameter. These give a soft, dead blow, that drives without marring the work and are to be commended. It is supposed, of course, that the workman will cast them himself.

At the present day, taps, dies and drills can be bought cheaper and better than the ordinary workman is likely to make them; therefore, I would recommend their purchase, and also that standard sizes, shapes and pitches be used whenever possible to avoid confusion.

Note the angle of the cutting lips on a new twist drill—the angle is fifty-nine degrees—and always grind to the same angle in future, as it gives the best results. For drilling unhardened steel, soft steel, wrought, cast or malleable iron, the twist drills as furnished by the makers are excellent, but for seamy stock, following a previously drilled hole, or in brass, copper, etc., the front of the cutting edge should be ground a little flat. This will prevent the drill from digging in too fast, or from running out of its proper course. A very little will do.

For drilling hard steel or chilled castings there is nothing better than the old-fashioned flat drill; if the stock be very hard, grind the flat drill with an oval point instead of the V form and temper it as hard as it will stand without breaking. Roughen the spot where it is intended to drill with muriatic acid and for a lubricant use turpentine or kerosene with some gum camphor dissolved in it. Keep the pressure on the drill firm and steady, rotate the drill slowly, and if the bottom of the hole gets glazed over, roughen it with the acid and try again. It is slow work and takes patience, but it can be done.

To drill holes in glass, use a copper or soft brass tube for a drill, using a tube slightly smaller than the hole desired. Rotate it at a moderate speed, so that it will not heat the glass. Supple the end of the tube that rests against the glass with plenty of soda solution and fine emery; back the glass up well to resist the thrust of the drill and use a small piece of wood with a hole in it that the drill just fits, as a guide for the drill; this guide can be cemented to the glass if desired. Keep the feed pressure firm and uniform, and supply the drill with plenty of water and emery. Drill half way through from each side.

The straight-fluted drill known in the trade as the Farmer is a very good drill for some classes of work, notably that of following another and similar hole, crossing another hole or for drilling seamy or porous stock. They also work nicely on brass, and are easier to grind than the twist drills.

It is well to know the pitch of all feed screws on machines or cutting tools; for instance, take the cross-feed screw in the carriage of an engine lathe. If it is eight threads to the inch, then one complete turn of it will advance the tool block one-eighth inch, which would reduce the diameter when turning one-quarter inch (.125 inch). Now, if the hub of this screw is graduated into fifty divisions, then rotating the screw one of the divisions would advance the tool two and one-half thousandths, which would reduce the diameter .005 inch. This lead screw and the tail stock spindle screw should also have their pitch figured out and their collars graduated. The lead screw can often have one of its gears used as an index, thus: If the pitch of the screw is six to the inch and a gear of thirty-two teeth placed thereon, a movement of three of the teeth will advance the carriage one-sixty-fourth of an inch, and moving it one tooth will advance it one-third of that much. Many modern machine tools are now made with the hubs so graduated that the movement can be read in .001 inch. It is a labor-saving device, and combined with the use of a good micrometer caliper, it tends to increased accuracy and better work.

Small-Bore Shooting in England

(*Continued from page 161*)

ting up to 100 yards was done by telescopes, the scores being counted when the targets were brought into the pavilion from the butts. The targets were tacked onto long planks painted black. Each plank held six targets and was supported at either end by an iron bracket bolted against the face of the butt. Behind the butt a number of spare planks with targets attached were kept in readiness, so that when all twelve targets in the upper and lower planks had been shot on, there was very little time lost in taking off the fired targets and replacing them with fresh ones. The 50-yard targets were at first printed on 12-inch square cards, and the 100-yard targets on 24-inch cards, but as time went on it was found that it was so seldom that a shot was outside the 5 ring that must of the target space was wasted, so a great saving was made by having target centers 6 inches square for 50 yards and 12 inches square for 100 yards, the card centers being tacked into the middle of white squares painted on the target boards. The 50-yard khaki and green targets, which were not so often used, were all printed on the full-size 12-inch squares.

(*This is the second of a series of papers by Mr. Fry. A third will appear in an early issue.*)

The Best from Contemporary Sources

IS THE automatic, or at least any model which has yet appeared, the ideal service pistol? I am one of those who maintain that at present the revolver will always beat the automatic in tests under service conditions. Much has yet to be done to render the automatic as reliable as the revolver. The barrel and body usually slide on the stock, and the block slides in the body. A very small amount of grit, a little rust, or neglect of lubrication will make these slides jam. And remember that even an enthusiast cannot keep his pistol as well on active service as he does in peace time.

The Ideal Service Pistol.

Another, though perhaps not legitimate, point against the automatic is that, in the hands of inexperienced users, it is far more dangerous than a revolver. And how few of the people officially armed with pistols can be said to be really trained in their use. At one time all staff sergeants were armed with revolvers; their annual beano with them on the range was enough to turn the assistant adjutant's hair white—not in a night, as in fiction, but in the hour or so of crowded horror.

I well remember the first time I took part in it. The master tailor began by just missing his foot, while loading "by numbers," and later the armorer sergeant was detected looking down the muzzle to see if he had still any unfired cartridges in his pistol. It is very seldom that one does need to use a pistol, but when you do, you "want it bad."

If one has a revolver, and it happens to be loaded, however wet, muddy, or dirty it is, it is practically certain to go off. If it doesn't, you pull the trigger again, and the revolver invariably performs its function. It fires a heavy bullet, and if you hit your man, even if you don't kill him, you will probably knock him down. The revolver can be drawn and fired almost in one motion, and using one hand. If you carry an automatic, you draw it, take off the safety catch, and hope for the best. If there is a cartridge in the chamber, it will probably go off. If it doesn't (and one must remember that the mechanisms are usually not as simple and hardy as those of a revolver), you have to bring it down off the mark and struggle with both hands to remedy the defect, thus placing you at your opponent's mercy. After a first shot, unless the automatic is in a condition of cleanliness and oiliness—very unusual and almost unattainable on active service—jams are liable, and the weapon may have to be taken to pieces and cleaned before it will work again.

Most automatics fire a bullet too small to stop an excited man; none of them will stop a savage. In the Soudan campaign of 1898, a "man-stopper" bullet had to be adopted for the .455 revolver, as the solid .455 bullet would not stop a charging Dervish. If the bore of the present pistol is reduced, we shall be worse off than ever next time we fight savages; there is usually a little war against savages going on somewhere. Rumor says a very high-power cartridge is officially favored. This is an imitation of German practice. The German "Parabellum" (Borchardt-Luger) during the war doubled its length of barrel, and the later model was sighted to 800 metres (with automatic correction for drift), and was provided with a butt and a magazine holding about forty cartridges. In other words, it became an inferior automatic rifle. Without the butt, it was an unhandy pistol. One can't make a double-purpose weapon to do both jobs well; either it becomes a moderate pistol and a very inferior rifle, or a rotten pistol and a moderate rifle. The Germans appreciated this, and just at the end of the war issued a "Bergmann" automatic carbine, using the pistol ammunition and high-capacity magazine. Another disadvantage of the double-purpose" weapon is that if it is sighted correctly for use as a rifle, it is all wrong as a pistol. The 7.65 m.m. Mauser, without its butt, shoots nearly 3 feet high at 20 yards.

If we are going to Germany for inspiration, here's another adaptation of a German dodge. The Bavarian Government, about 1871, was impressed with the idea of cutting down the various kinds of ammunition required. At that time it was customary to have three types of small-arm ammunition, viz., rifle, carbine, pistol. Bavaria had failed to discover our idea by making rifle and carbine cartridge of the same external dimensions, but used the rifle cartridge, shortened for use only in the carbine. Also they constructed an enormously heavy pistol to take the carbine cartridge, thus reducing the number of kinds of ammunition from three to two, viz., rifle and carbine. Now, we seem to be getting at last in the direction of using a rimless cartridge. This rimless cartridge, cut down, would give us a pistol cartridge of about .430 to .450, which wouldn't fit any existing pistol! It is possible that fired rifle cases could safely be used again for pistol cartridges, an economy which should recommend this suggestion to the Government. Experiments should be made as to the necessity or otherwise of jackets on bullets for automatics of .400 or over, so that we could have a solid bullet for "civilized" and a "man-stopper" for "savage" warfare. The .455 revolver cartridge shoots well in the .455 Webley automatic, and the bullets do not strip or lead the barrel any more than they do in a revolver. With the rim slightly reduced so that they will go into the magazine, they operate the pistol correctly. Seeing the danger to revolvers that the .455 automatic cartridge is, why not for the present *withdraw* the .455 automatic cartridge and issue a modified revolver cartridge suitable for both revolvers and automatics?

The new automatic pistol must be much more reliable under service conditions than it now is. It is possible that a gas-operated weapon might be more reliable than a recoil-operated one. There is a French gas-operated pistol, the "Clair," which fires the 8 m.m. revolver cartridge, model 1892. Another French automatic, made by the Société Francaise des Armes and Cycles, St. Etienne, leaves to the recoil only the work of replacing the cartridge; the trigger cocks and releases the hammer, as in the .38 Smith & Wesson hammerless revolver. The trigger-pull is long, like that of a revolver, thus tending to lessen the risk of accidental discharge. Another feature is the tip-up barrel (canon basculant), which drops when the magazine is withdrawn and exposing to view the cartridge which may be in the chamber.

The following are some suggestions for improvements:

(*a*) Roller bearings instead of slides. Rollers are much less liable to jam than slides, and could be mounted externally, so as to be easily cleaned.

(*b*) An emergency operating device, which, in the event of the pistol failing to function can instantaneously be brought into play to reload the pistol without the necessity of having to take the pistol off the mark or to use two hands to correct the fault.

(*c*) Gas operation.

(*d*) Firing mechanism operated by trigger, leaving reloading *only* to the recoil. This to simplify trigger gear.

(*e*) Improved ejector; as with present types if the pistol works sluggishly, the fired case does not eject well, and, falling back into the breech, jams the pistol.

(*f*) An indicator should always be fitted to show whether the pistol is loaded or not. R. Brown in *Arms and Explosives.*

THAT wadding influences the ballistics of the shotgun, and to an extreme degree is, I think, beyond all doubt. If you have cartridges loaded, same cases, powder, and shot, but with different grades and classes of wadding, you will get very great differences of pattern and penetration at the plate and rack and strawboards. It is the over-powder felt wad that makes most difference, too hard felt being the greatest sinner. Undoubtedly the felt wad travels, more or less, through the shot charge and disturbs it proportionally. The concave felt over-powder wad gives the best results, and the best concave wad is that which becomes concave from the force used in seating it on the powder. The whole secret is in the wadding and the method of seating the wad. Some of the felt wadding being used in cartridges now being supplied to the sporting public at the price of 17s. 6d and 18s. per 100 is extremely poor; result, pattern and penetration inferior.

The Wadding of Shotguns.

I am not "the only pebble on the beach." Dozens of sportsmen have complained to me of the quality of the cartridges being supplied today. We cannot compare the loading and shooting of the muzzle-loader with the modern breech-loader, because black powder was used in the former, and any old wadding did over our trusty old friend, the "black." As a boy I have loaded black powder into cases that had so often done service they were only hanging together, and the turn-over was so ragged and limp it just sufficed to keep the shot from going adrift into one's pocket. Yet these cartridges shot quite all right. Fancy modern nitro being treated in the same way. It would not "hit a dent in a pat of butter." One cannot be too particular about the wadding used with the modern nitro powders, and also with the methods of loading. The overshot wad, if not too thick, makes but little, if any, difference. Years ago an overshot wad came on the market which was cut in four sections, and which went to pieces on leaving the muzzle of the gun. I tried them, but they made no difference in the pattern, and so I went back to the ordinary thin card.—W. H. Bradish in *The Shooting Times and British Sportsman.*

IN LAST month's article we commenced to look at the experiments—useful and curious—which the late Dr. Franklin W. Mann made a faithful record of, for the benefit of his fellow riflemen, in his book, "The Bullet's Flight from Powder to Target." We may continue this month to look further into the account of this painstaking American experimenter's work.

We remember, as related last month, his determined effort to lick the family rifle into shape when a lad of 12 years of age. At the same youthful period of his life he busied himself in making bullets that "could be entered concentric with the bore of the old rifle." Young Mann proceeded by taking a simple chunk of lead, "passing it back and forth through the bore of the rifle, swaging repeatedly and jack-knife whittling, until the rifle grooves were comparatively perfect upon its sides, oval point centrally balanced and base at right angles to the body. Then the plaster-of-Paris mold was made by aid of the first bullet, and several others were successfully cast in it." Right at the beginning of his rifle career it is to be noticed that the young enthusiast was aware of the importance attaching to the shape perfection of his projectile.

American Enthusiasm in Rifle Shooting.

As a specimen of the "curious" experiments which were from time to time undertaken, we have next an attempt to find what happened when a Krag bullet was fired into confined water from his 1895 model Winchester. Mann took an ordinary steam pipe 14 inches long and 2 inches inside diameter, and, plugging this tube with wooden stopples a quarter of an inch in thickness, filled it with water. "At 20 feet distant," remarks the experimenter about this little diversion, "a shot was made directly end on, and this Krag bullet, by a lucky hit, entered the pipe at center of the wooden plug. As the bullet flew from the muzzle the water in the pipe returned in the path of its flight, and back over the line of sights, dousing the shooter's eye in quite a startling manner. The steam pipe was split its entire lenght, and for half the distance the opened seam was a finger's width." There is little to comment on this experiment, except that either the returning spray must have been very much like that from the rose of a garden watering-can in order that it should douse the shooter's eye situated nearly seven yards distant from the steam pipe, or that the steam pipe had been tilted upwards by the force of contact of the bullet and a visibly curved trajectory of water had resulted. It is a little too much for belief that the statement that the water returned in the path of the bullet's flight was intended to be accepted altogether literally. At the same time as this experiment with the steam pipe was made Dr. Mann also shot into a number of cans filled with water. Seven tomato cans were placed on top of one another after being filled with water, to form a perpendicular pile about 40 inches in height. Firing downwards into the pile, "the bullet opened all the cans by splitting down their sides, through the sudden pressure transmitted to their contents. So great and sudden was the pressure that the circular sides of several of the cans were straightened out flat."

Still more curious is an "experiment" firing through glass. Dr. Mann uses a whole page of his book to reproduce a photograph of a bullet hole made through common window glass. He comments thus: "The bullet which made this hole was shortened from its front end to weigh but half the regular one, thus leaving its front end as square as its base. The negative from which the plate reproduced was made appears like the window glass through which the bullet was shot; so close is the imitation that by placing each in like frames it would puzzle one to select the negative from the mutilated glass without a close inspection." Surely a most extraordinary experiment upon which to expend time and trouble and a page and a quarter of his book to describe and illustrate!

When it is desired to recover fired bullets without deformation, the usual practice is to fire them into a receptacle containing oiled sawdust. Dr. Mann tried the effect of firing into snow, and he found that of 206 bullets recovered in good shape, 122 were so perfect that they could be put in a lathe and bases tested. The experimenter had a serious purpose in view in recovering these 200 odd bullets. He used various bullets and charges, and he was anxious to determine "if the base of the bullet was oblique to the bore at time of its exit from muzzle." His results are worth noting, and are set down in his own words thus: "Measurements of obliquity of the 122 perfect bullets, in decimals of an inch, are as follows: Two bullets were .0; five were .00025; six were .0005; twelve were .001; fourteen were .002; 22 were .003; four were .0035; eleven were .004; ten were .0045; four were .005; three were .0055; eight were .006; three were .007; five were .008; one was .0085; one was .009; one was .010; one was .011; three were .0115; one was .012; one was .013; two were .014. Twenty per cent of these bullets, one out of five or two out of ten, have their bases over .006 inch oblique, and this is the usual proportion of off shots in regular careful target practice. This one off print in fine-group shooting has been markedly noticed in all lead-bullet work of the writer, and two such shots in ten have been remarked by a great many target men all over the country." Dr. Mann later on discovered that oiled sawdust was the thing to use; it gave better results, and, unlike snow, it was not necessary to wait for a certain period of the year in order to obtain it.

Dr. Mann's best work was in endeavoring to find the reason for the "off shot." There are pages of experiment recording and letters to Dr. Skiner, "Medicus," and the latter's reply to one of Mann's dealing with the subject is worth reproducing here:

"My Dear Mr. Mann:

"I think your remarks on my manuscript, respecting the off shot, are correct, and I have summed it all up in a very short synopsis, as is here recorded: We will suppose the imperfect rifle is eliminated; imperfect ammunition is eliminated; bad holding, gravity, wind, jump, humidity, a passing cloud, and, in fact, everything pertaining to, or that can influence the flight of the bullet, is eliminated. What we call an 'off shot' is conceived at the breech of the rifle; its period of gestation is 32 inches; its accouchement is at the muzzle of the rifle; its period of adolescence is 200 yards, and of five born four are perfect units, one is not; why? Because of the perversity of inanimate nature. We have not reached or found our zero in rifle shooting. The rainbow is just over the hill, and Mr. Mann will ride it as soon as he can get astride it.

"Yours truly,

"S. A. Skinner."

This letter was very nice of Dr. Skinner, and Dr. Mann duly appreciated it. He tells us that "Medicus" was a recognized authority on the rifle, and that he wrote extensively for "Shooting and Fishing." "As creeping age debarred him from attending to the practice of medicine," Dr. Mann remarks of his friend, "his offices were generally turned into a 'den,' filled with material of his own make, largely pertaining to the rifle, its ammunition and paraphernalia, indexing and photographing his very unique and valuable collection."—"Ballistica" in *The Rifleman.*

A music publisher the other day received from a young girl in one of the small towns a touching ballad of her own composition, entitled, "I wonder If He'll Miss Me?"

He returned the effort to the sender with the following note. "Dear Madam—If he does, he should never be trusted with firearms again."—*Marbles Message.*

SHOOTING NEWS AND COMMENT

Some Current Notes on the .22

"A wise man changes his mind—a fool never."

By TINNEY

I NEVER have been and never will be a target shot. From the very beginning of my experience with the grooved tube I looked on the rifle as a deadly weapon to be used against game, or man, as the circumstances warranted, but never for a moment regarded it as a toy or a piece of sporting equipment, like the baseball bat, the golf club or the tennis racket. To me, shooting is a serious proposition, a matter for earnest study and profound consideration. Not that I fail to feel and appreciate the spirit of real sport that always attends every form of practice with any of the four weapons, the shotgun, the pistol, the hi-power rifle and the useful and available ".22"; I simply never lose sight of the fact that such practice is merely a means to an end, a training undergone in preparation for an event that I expect will occur sooner or later. This event may be a hunt, a fight or something vastly more effective—the building up of a reputation that will make fighting unnecessary—yet the result is always the same. The rifle range is, and never can be more than a school of instruction, a place where men acquire certain skill, knowledge and technique that can be applied to the problems met with in the hunting field and on the battle line, and the man who forgets this fact is not wise. To the target shot this perforating of an inanimate black spot silhouetted against a clean white background, at standardized distances under fixed conditions, is the great objective, and to do that just a little better than any one else is the goal of his ambition. Such men are typified by the Scheutzen shooters of a decade ago, the old line military riflemen, the small-bore cranks of today, who drop down on their tummies and hunt the ten-ring of the decimal target according to the tack-hole school of shooting, the slow-fire pistol bug and the match riflemen, who meet at Bisley every year. These men are good shots and keen sportsmen, men of the sort that one is proud to refer to by the name of "friend," and, "be it remembered" that they are the men who, always unaided and seldom appreciated, have worked out, developed and made possible every improvement and refinement in arms and ammunition. The modern rifle is not the product of the great corporations who manufacture and market the arm. In the past these companies were merely business machines that produced and sold an article for profit. The creative work that made the article one worthy of manufacture—the ideas and inventive genius, the research and

experimental work necessary to the production of the original model—has almost invariably been the work of some unpaid, unappreciated and forgotten amateur who, during his span of life, was regarded as an unfortunate individual suffering from a mild form of insanity. The match rifleman has developed and perfected his pet weapon because it pleased him to do so. He did this entirely "on his own" without hope of reward or recognition—and received neither—the arms companies took the cream of his labors and profited greatly thereby. (Men like Dr. Mann and E. A. Leopold.) Nothing pays better than "cashing in" on other men's brains. I know the head of a great arms industry who has never fired a gun, never intends to shoot one and has not the slightest interest in anything pertaining to the technical side of his firm's products. He is merely a shrewd business man who in various ways acquired the products of other men's brains and sells them at a substantial profit to himself—he is nothing but a soulless corporation in a pair of pants. Fortunately, the day of such arms companies is past; several remain, but now they are confronted with a bitter alternative—reformation or dissolution. Big, broad-gauge firms who are composed of real, red-blooded humans have established a new policy of fair play, tolerance and appreciation. They maintain well equipped ballistic laboratories operated by skilled chemists and experienced engineers; exhaustive research and experimental work is being constantly carried on; they welcome the gun crank, treat him kindly, help him whenever and however possible, thereby making him their lifelong friend, and in return the gun crank delivers a quality of local advertising no money can buy. The gun crank is happy, the firm prospers and the buyers get better goods—everybody is satisfied. This is the new order of things and the sphere of usefulness now open to the match rifleman is greater than ever before and steadily increasing.

As already indicated, I appreciate and approve of the simon-pure target shot. He is a dreamer with the guts and gumption to make his dreams come true. I like him and understand him; he is a warm friend of mine, and because we are good friends I do not hesitate to tell him of his faults, even as he tells me of my own. He is much too valuable a man to think only in black bull's-eyes and distances laid off by a surveyor; his resourceful and analytic mind is too closely confined, he should think along broad lines; he is worthy of a larger field than he now occupies.

In many respects ARMS AND THE MAN is an ideal publication; it is free of commercial domination; it gives the ballistic John-the-Baptist a place to voice his prophesies and its readers are its contributors, a sort of weekly news letter to the faithful whose patriotism does not die out with the fireworks and repose in mothballs until the 4th day of the following July. We who support, read and fill this old powder-stained journal do not always agree; some of us jump at conclusions and others are "kinder sot in their ways"; all have ideas with a capital "I" and are not at all bashful about expressing our respective opinions; possessing enough inherent cussedness to keep healthily progressive, we manage to make life interestinbg for all concerned—which is right, proper and as it should be. But most of us are merely target shots who do not think beyond the point of perforating paper. We forget that bull's-eye hunting is merely the most elemental form of training. Most of you regard Brother Newitt as a target shot and not without cause. He did more to promote the sport of Miniature Rifle Shooting in England than any other ten men, living and dead; he designed and "put over" the Standard Decimal Target now in use; he was the first man to make a "possible" on the said Decimal Target at 100 yards with a .22-caliber lo-power rifle; he kidded the Society of Miniature Rifle Clubs into permitting the use of the peep sight; at the Southfields Club, England, he set a shining example of what can be done in the center of a densely populated district; he helped Crossman and Wotkyns "put over" the ".22" game at Caldwell, and here at the National Proving Station he is an unending source of help just when it is most needed, yet he is not a target shot. As a Captain of Cavalry, he scampered about the veldt for a few seasons playing tag with Brother Boer and learned a lot in the doing—no man who has "seen service" is a target shot—he knows better. He does not despise the target, it is useful and has its place as a training medium, but, as Newitt has so often remarked, "After a man has learned to group his shots he is ready to apply the technique of the weapon and should be set to shooting at natural targets under i conditions." This may sound like rank heresy—truth often does.

Down here at Tenafly, we faithfully adhere to one slogan: "There ain't no rules." Just because something has never been done before and is not "according to Hoyle" is no reason why it shouldn't be done, we'll do anything once, and if we like it we'll do it some more. There will always be plenty of black-and-white targets for "that what like 'em," but once a man has learned how to group, adjust his sights and understands the finer points of the game, he will be put to shooting at natural targets at unknown distances against the background provided by Mother Nature—rabbits, crows and Huns in field-gray uniforms that pop up out of the hillside. Field firing with the ".22" is possible, practical and profitable. "Example is better than precept," so we have decided to "carry on" as we think best and toss tradition into the open fire that makes Headquarters a cheerful place these cool fall evenings. Let those who have ideas on the subject "come across." If they live near New York city they are urged to accept this as a blanket invitation to come out to Tenafly in person, and we will be right glad to give their ideas a thorough tryout. The trouble with everything in this world is too much talk and too little action—shooting is no exception. The National Proving Station is built and maintained for no other purpose than the execution and concrete application of those doctrines preached by ARMS AND THE MAN. All we say to our brother gun cranks is come out and demonstrate; first, we will listen, then, we will help you check up the matter by actual shooting under the proposed conditions.

We tried out the Bisley System of marking and find that it works perfectly for both military and decimal targets. We held a match on the "Miniature-C" target and now know its virtues and its limitations. We have just tried out the Standard Decimal Target for 200 yards and find it to be an ideal match target for that range. Dan Hoag is hi-gun to date with 93x100 and five shots

straight in the 4-inch ten-ring. Newitt is next with 91, but really a much better score than Hoag's, as all Newitt's shots were in the 8-inch sighting-bull, 9 nines and a 10 on the 7th shot, a ten-shot 8-inch group made on a windy day. Fry, the English chap who writes so entertainingly about his experiences in Australia and Paul Landrock both made 90; several other good shots have also taken a crack at this target and find 85 to be a creditable score. When you want to find out "Who's who" in the .22-caliber lo-power match rifle game just give each man 5 sighters and 10 shots for record at 100 yards and 5 sighters and 10 shots for record at 200 yards, using the respective decimal targets for each distance, and after the 30 shots are fired you will know, also the score sheets will be as devoid as "possibles" as a turtle is of feathers, and ties will be conspicuously absent. For match shooting these conditions come mighty close to being ideal. This 200-yard work with the "twenty-tooze" has taken such a firm hold on the bunch that we find it necessary to erect a housed-in and heated firing point so the work can be carried on all winter; also, we will make the butts comfortable by the same means. So far we have used the old standardized black-and-white stuff, but the natural--colored effects are due to arrive soon. The principle involved is "do things first and discuss them afterward"—not the fireside method of theorize, rush into print and then—theorize some more.

One thing we have learned in our 200-yard shooting this fall, the normal group of the .22 long-rifle cartridge when fired from a fine match rifle, that is, the best group the arm and ammunition is capable of making under average conditions, is about eight inches and inclined to be eliptical in shape. The English method of expressing a group by a rectangle is really superior to the circle we customarily use, as the rectangle shows instantly whether the prevailing error is latteral or vertical, whether the dominant divergence is due to an imperfect barrel or uneven velocities, and according to this standard, the ten-shot pattern will measure about 6x8 inches when the firing is done by seasoned riflemen who know the long-range game and get away each time with a perfect hold. Frankly, I never expect to see a "possible" made out-of-doors on the Standard Decimal Target at 200 yards. It might happen on a dead calm day, firing from a muzzle and elbow rest and a "lucky lot" of unusually fine cartridges, but even then it could not be repeated. And right there is one of the chief virtues of the 200-yard decimal target for match shooting—it holds up a standard that is never quite attainable and gives the tack-hole boys a rainbow they can never catch, except that by a fluke that will make shooting history. And what a lot it teaches one about those five old enemies to accuracy—trajectory, drift, wind, light and atmosphere. At 25 and 50 yards the palm goes to the man who holds the best, but that is not so at 100 and 200 yards; doping conditions counts a lot, anywhere from 5 to 20 points for each score of 100, quite enough to make the Tyro appreciate the wisdom of the old-timers.

One thing is certain, for teaching a man how to shoot, either indoors or outdoors, there is no reason in the world for going beyond the lowly ".22." It enables the Tyro to learn the target game from "soup to nut"; on moving targets it is always equal and often superior to its big brothers; for skirmish runs it works out perfectly—but that is a form of field firing, a subject we are not prepared to discuss, leastwise, not just yet. One thing is badly needed, a set of natural targets representing both men and animals to be fired on at unknown distances under field conditions. Just now we are hard at work on this problem and by spring the work will be completed, including hostile troops, a running deer, bobbing bear, the crow and brer rabbit. (We had some live cotton-tails on the place until recently, the hunting season opened yesterday and tonight we had rabbit for dinner.)

And that reminds me, we have tried out clay-pigeon shooting with the ".22" rifle. It can be done and offers the keenest, snappiest, most fascinating form of shooting extant. Yes, they do hit 'em—occasionally—just often enough to keep a man everlastingly at it, and how that little lead pill does annihilate a tar hawk when it connects. It is simply wing

shooting developed to the Nth power; it teaches a man to hold close, get there quick and let off on the split second. We will soon be able to give some real data on this subject and a few scores—maybe. So far we have refrained from keeping score at all out of consideration for the feelings of those shooting, but just the same we had a lot of fun and the gang found it a right lively way to spend an afternoon.

The Cost of Special Guns.

Frequently a letter comes in to me from a sportsman complaining bitterly because So and So Firearms Company turned down his request for a price on a rifle or shotgun embodying what appeared to him to be a very simple change in the mechanism.

On the surface it does not seem strange that firearm makers, who turn out such a fine piece of mechanism as a rifle or shotgun, should be unwilling to make simple changes to make the weapon conform to the customer's own ideas.

The real reason for this state of affairs is because modern firearms are manufactured by machinery on a quantity basis, and the sportsman who has not studied this subject can hardly realize the enormous amount of time and energy needed to place a new model of firearm on the market.

Assuming that the inventor has finished a complete working model, the first step toward putting the gun on the market is to make complete detailed drawings of every part of the gun. This takes considerable time as the dimensions of the various parts must be checked against each other, so that the allowable limits in the size and shape of the parts will always produce a perfect working mechanism.

After the drawings of the parts are completed, process engineers take each individual part and decide on just how it is to be made from the raw material to the finished part, and then also decide on the kinds of machines to be used. After that the plans go to tool designers who make drawings of the fixtures and jigs necessary to hold the work for each operation, and the cutters which cut away the steel or wood to shape the parts. These drawings are sent to the tool room where the fixtures and other tools are made, and after that another gang of skilled mechanics set up the machines and get them working properly.

These machines are then turned over to the machine hands who are to operate them, and the manufacture of parts is begun.

At every step of the work, expensive, specially made gauges must be used to see that the parts are exactly the right size and shape.

The secret of the astonishingly high quality and low cost of American-made firearms lies in the production of many rifles and shotguns, all exactly alike, and you can readily see why the manufacturers frown on attempting work which would in any way interfere with regular production.

If you have your heart set on some change in your pet firearm, which is not listed among the regular extras supplied by the company who make it, you can have any kind of work you want done by the firms who make a specialty of tool, jig and fixture work, but you will probably find that while the work will be done exactly as you want it, it will cost a sum of money out of all proportion to the rest of the gun.

A. P. LANE.

These clubs have been admitted to membership in the National Rifle Association of America:

CIVILIAN CLUBS.

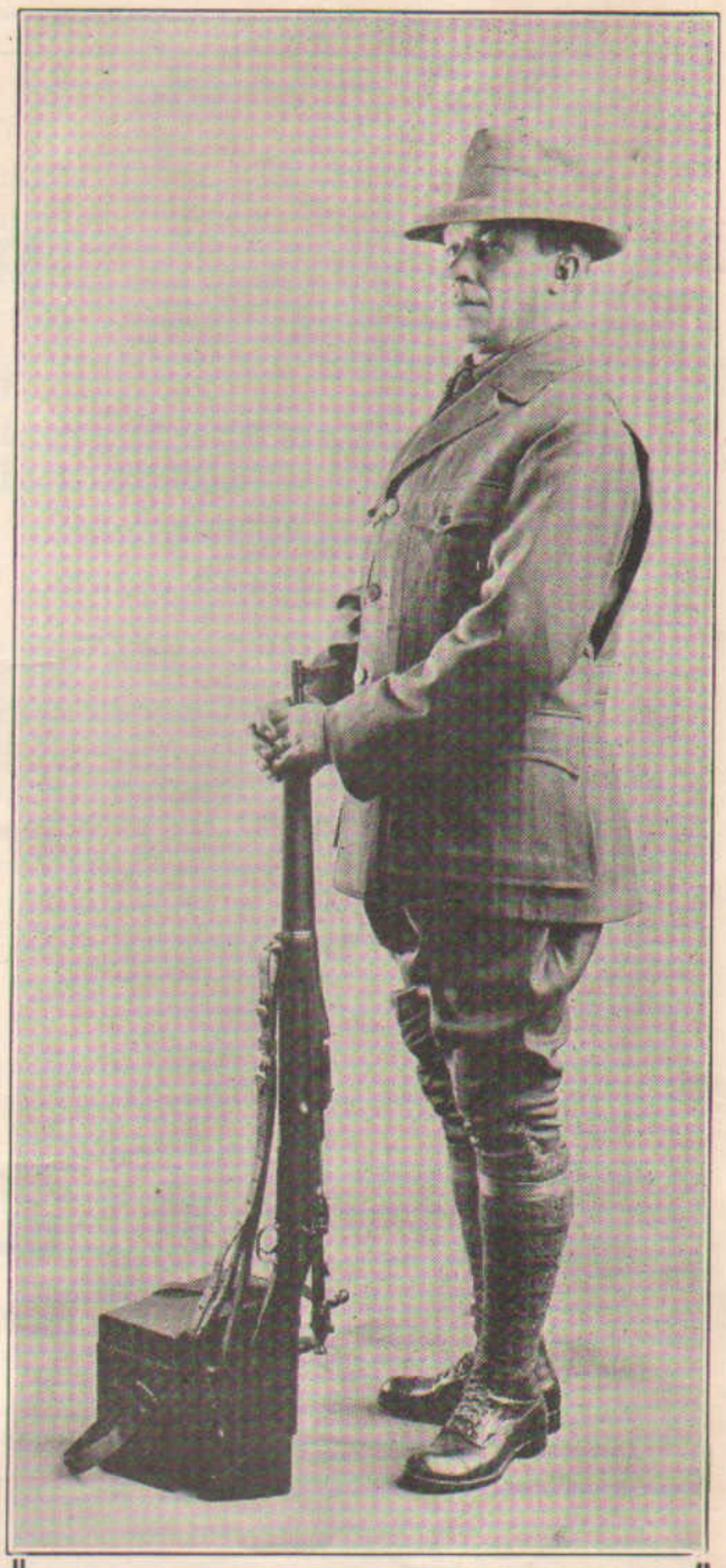
District of Columbia.

National Capitol Rifle Club, Washington, D. C.—A. A. Nourie, secretary; H. H. Leizear, president; C. E. Murphy, vice president; W. C. Robertson, treasurer; J. H. Robertson, executive officer. 34 members.

COLLEGE CLUBS.

Georgia.

North Georgia Agricultural College Rifle Club, Dahlonega, Ga.—S. Horton Christopher, secretary; D E. Aaron, president; Wm. H. Hopkins, vice president; Charles W. Lawrence, treasurer; Lieut. Col. Smith A. Harris, executive officer. 180 members.



WANTS AND FOR SALE

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

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

Kentucky Flint-Lock rifles, old-time pistols, revolvers and guns. Large assortment. Reasonable prices. Printed list free. Stephen Van Rensselaer, 805 Madison Avenue, New York City.

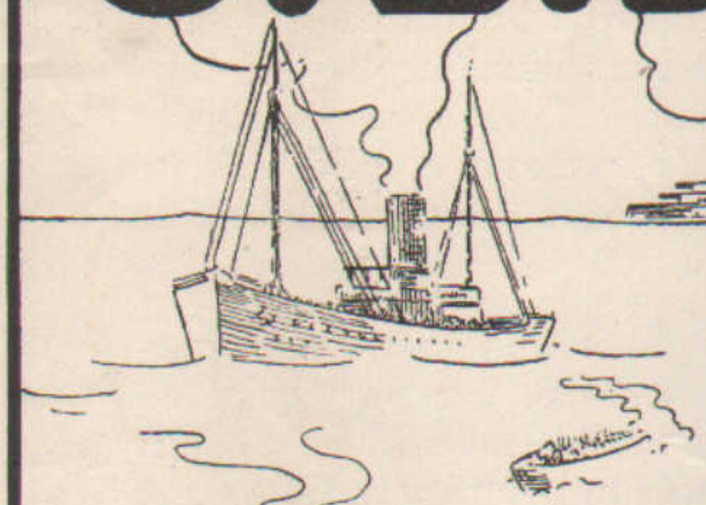
If you have Rifles, .30 calibre, or Pistols or Cartridges at low prices, write description and price to T. W. Hanna, Lamy, N. Mex.

Remington 10-inch pistol, Peterson barrel, .44 Russian, first-class shape, $30.00, or will trade for S. & W. Russian model, 6-inch barrel or longer, target sights, in first-class condition; and calibre. Jack Lichliter, 402 West Fourth Street, Spokane, Wash.

FOR SALE.—One Smith & Wesson .22 Long Rifle Perfect Target Pistol, with detachable skeleton stock, perfect order. Price, $16.00. Geo. C. Warner, Box 33, Claremont, N. H.

WANTED.—S. & W. Special Calibre Revolver with 4-inch barrel and target sights. Carl W. Wahrer, Physicians' Bldg., Sacramento, Cal.

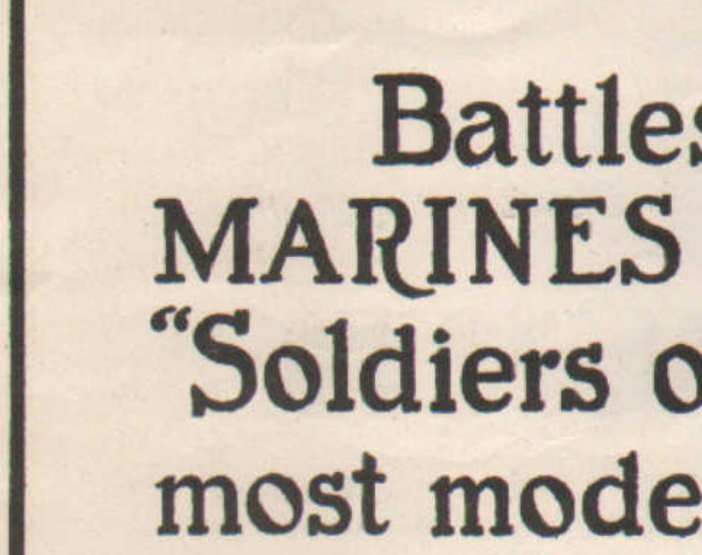
U.S. MARINES

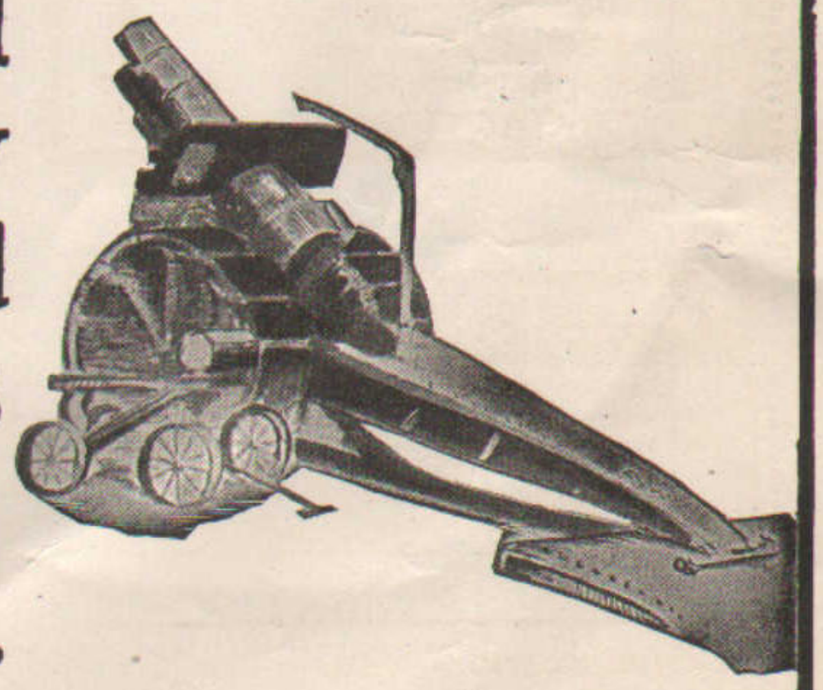


"READY TO GET OFF THE BOATS SHOOTING"

(Major General Barnett before House Committee)

Battleships cover the landing of MARINES from their transports – These "Soldiers of the Navy" employ ashore the most modern and approved type of ordnance – –heavy howitzers, field artillery, Lewis Machine guns and small arms.





CRACK SHOTS – – –EVERY ONE!

U.S. MARINE RECRUITING STATIONS – ALL LARGE CITIES.

WRITE FOR BOOKLET

PW

Model Printing Company, Washington