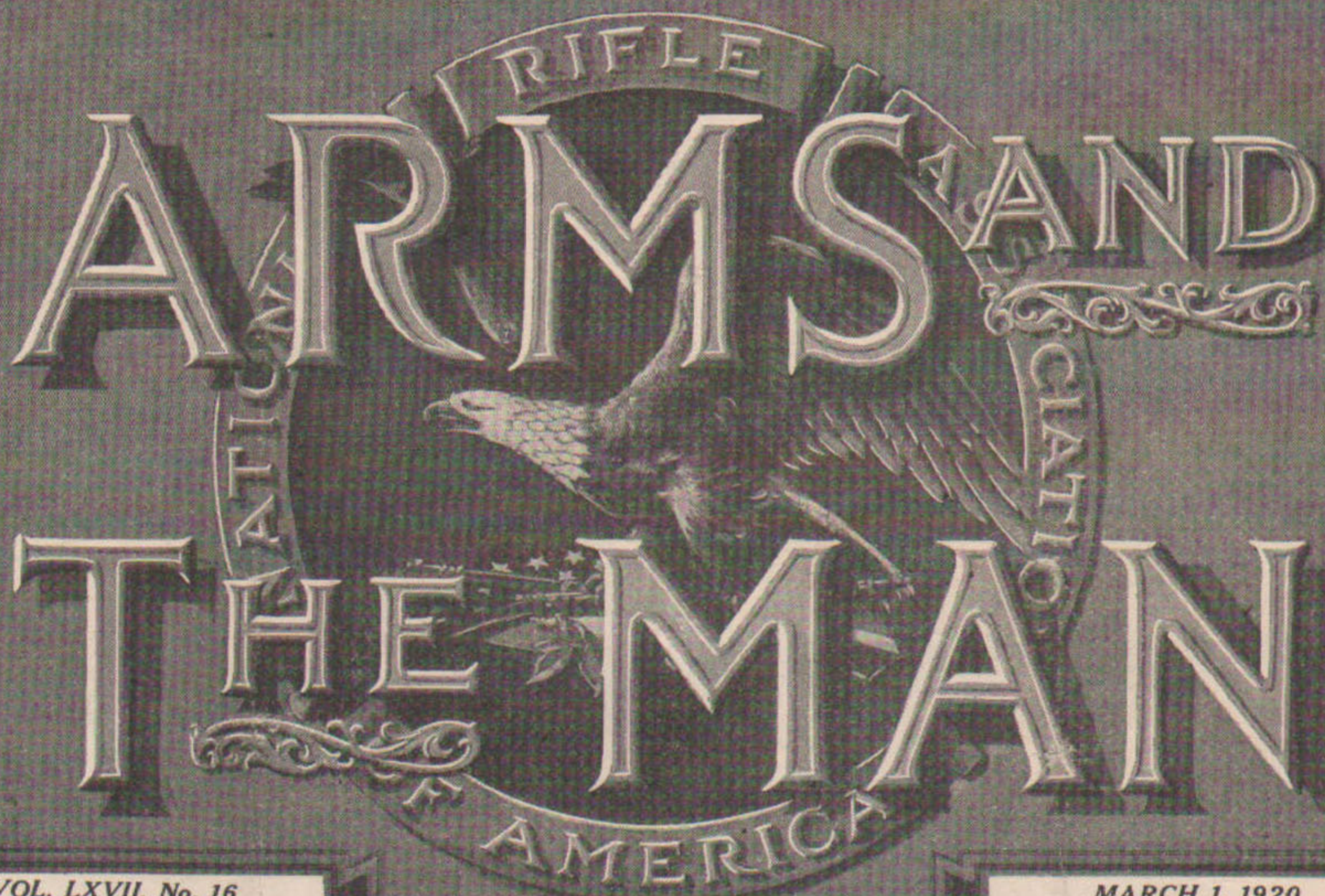


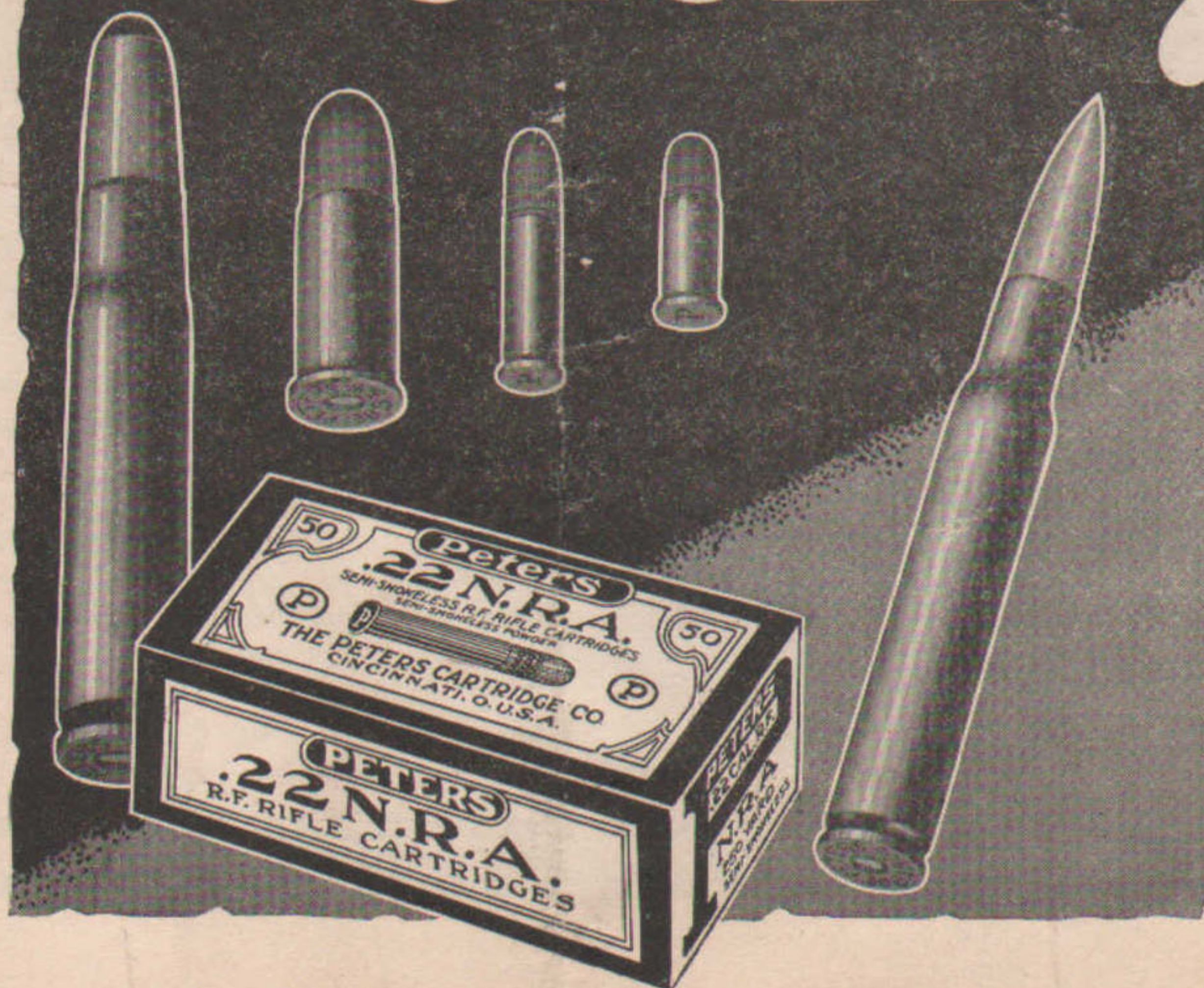
THE AMERICAN RIFLEMAN'S MAGAZINE



VOL. LXVII, No. 16

MARCH 1, 1920

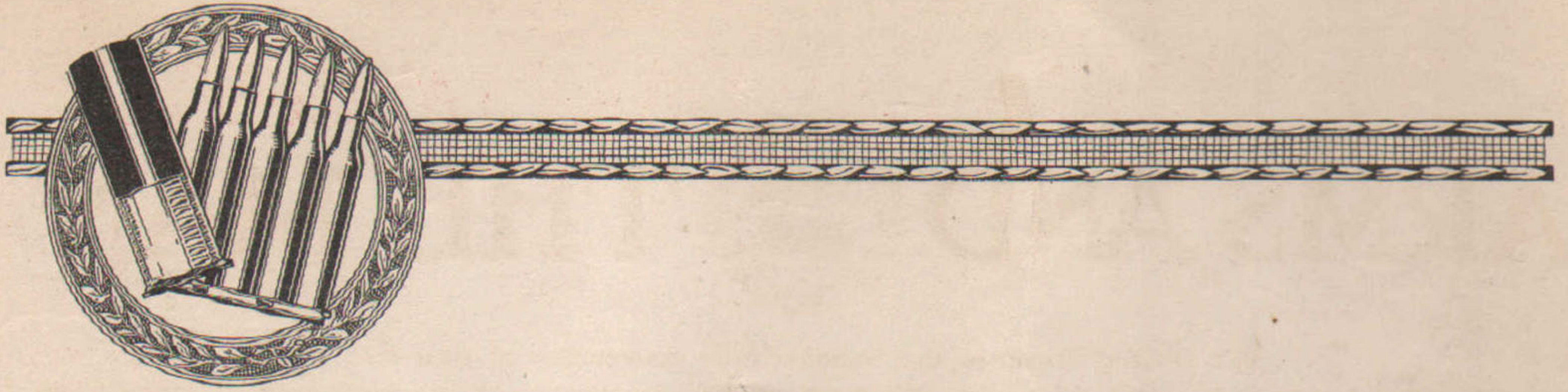
Peters Cartridges



It is a significant fact that most of the N. R. A. competitions have been won by shooters using Peters Cartridges.

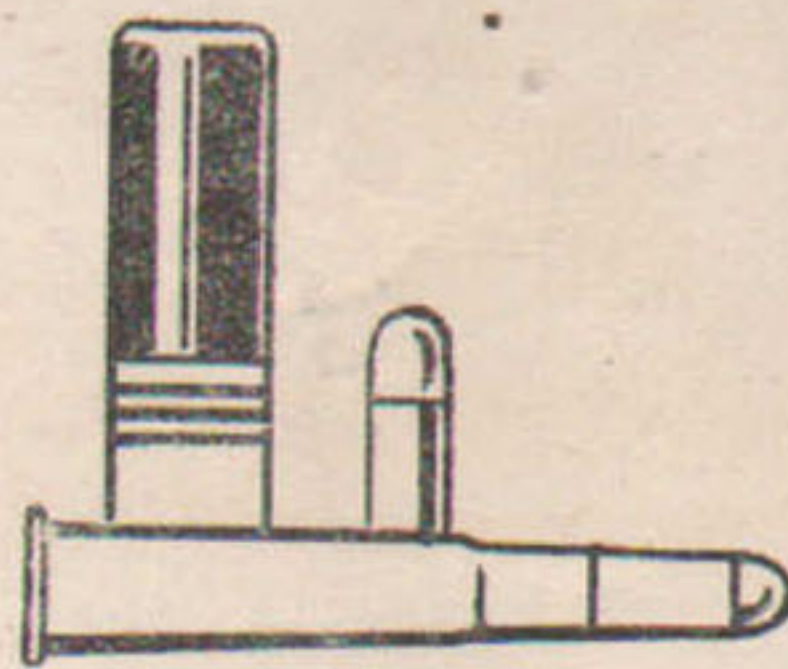
The .22 N. R. A. 250 yd. Cartridge is built according to the same Peters standards that have always given shooters better ammunition. It operates in any rifle chambered for Long Rifle Cartridges.

Get the  Brand



DU PONT

Powder makers for all
sporting and military uses



E. I. du Pont de Nemours & Company, Inc.

WILMINGTON, DELAWARE





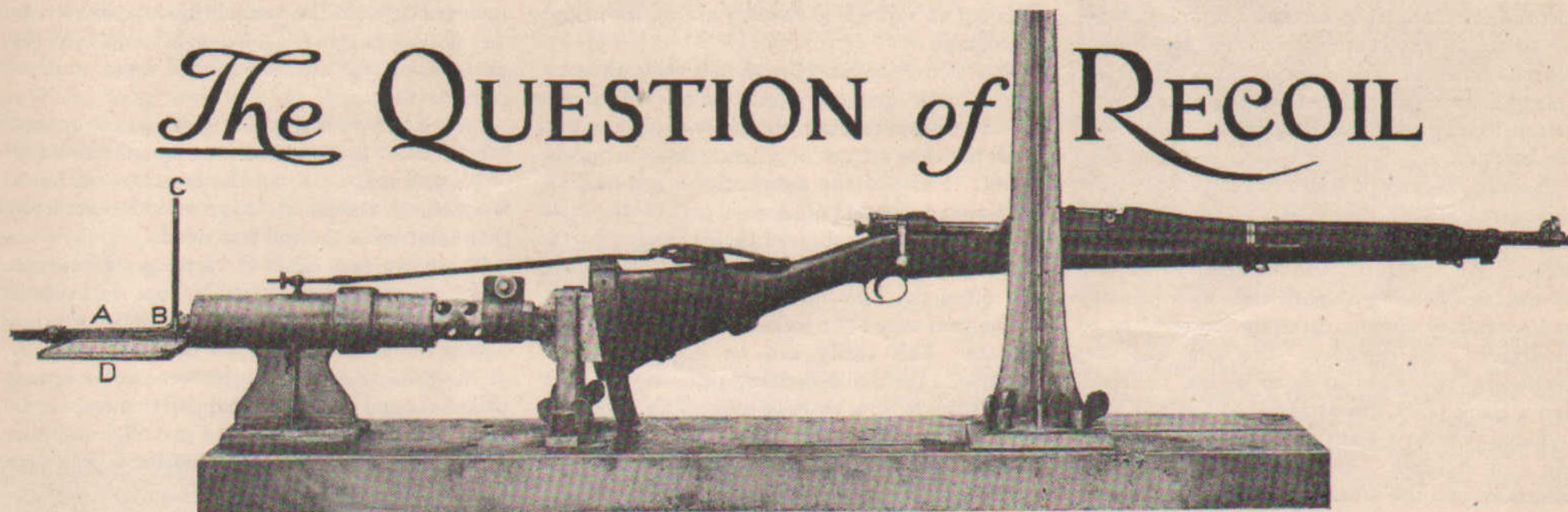
The Official Organ of the National Rifle Association of America

Volume LXVII, No. 16

WASHINGTON, D. C., March 1, 1920

\$3.00 a Year. 15 Cents a Copy

The QUESTION of RECOIL



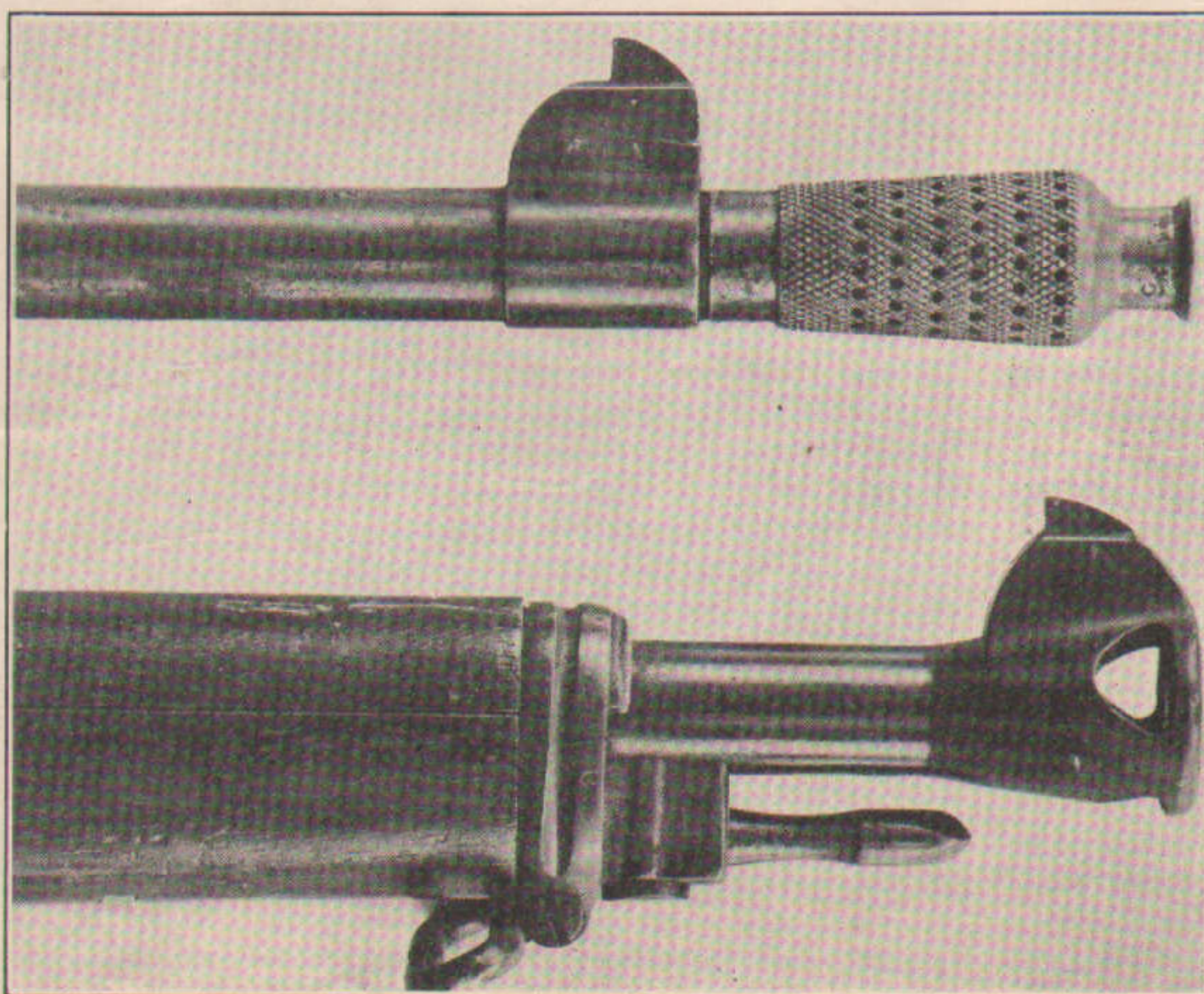
By LIEUT. COLONEL JULIAN S. HATCHER and MAJOR JAMES L. HATCHER, Ordnance Department

WHEN a gun is fired, it tends to recoil, or move backward. In other words, it kicks, as everyone who has used firearms knows from experience. The recoil varies in amount depending on the size and weight of the gun, the weight of the bullet, the kind of propellant used.

The reason that a gun recoils when it is fired is that when the powder turns into gas it expands, and exerts pressure in all directions. It pushes forward against the bullet and backward against the breech of the gun with exactly equal force. The bullet at once starts backward. As the bullet is much lighter than the gun, it moves much faster. The ratio of the forward speed of the bullet to the backward speed of the gun is inversely the same as the weight of the bullet to the weight of the gun. Of course this is assuming that the gun is free to move. If you have the gun against your shoulder, the weight of your shoulder is added to that of the gun, and the gun's motion is reduced. From these considerations it follows that the heavier a gun is, the less it will kick. For example, the Springfield Rifle weighs $8\frac{1}{2}$ pounds and the Browning Automatic

weighs 17 pounds with magazine loaded, and they both shoot the same cartridge. Measured in pounds on the Springfield Armory dynamometer, the recoil of the Browning is half that of the Springfield.

In general, the recoil of a weapon consists of two distinct parts. The first is the backward motion of the gun before the bullet leaves the muzzle. This is relatively small in amount. The second part is the more violent backward impulse which occurs just after the bullet leaves the muzzle. At this moment the pent-up gases rush out and react against the atmosphere with the result that the gun is thrown violently back. The total recoil is the combination of these two parts. In measuring recoil, the total recoil is the quantity generally sought. In the Experimental Department of Springfield Armory this measurement is made by means of the dynamometer shown in the cut. The rifle is suspended at its balance by wire, so that the butt rests against a coiled spring of known strength. The spring is attached to a plunger which carries a pencil resting on a sheet of paper. When the gun



Types of Recoil check for small arms. The lower example is similar in principle to the type used in the Lewis Aircraft Machine Guns.

is fired, the butt-plate pushes the spring back until its resistance overcomes the force of recoil. The work done in compressing the spring is a measure of the force of recoil, and from the known strength of the spring, its value in foot-pounds can be calculated. The amount that the spring is compressed is recorded for each shot by the pencil in moving over the record paper.

A much more difficult matter is the measurement of that part of the recoil that takes place before the bullet leaves the muzzle. As it only takes a little over a thousandth part of a second for the bullet to travel through the barrel of the Springfield, and as no part of the recoil that occurs after this time is wanted in this measurement, it can readily be seen that it is no easy matter to make the determination. In the design of semi-automatic weapons it becomes very desirable to know this recoil, however, as we want our breech to stay locked as long as the bullet is in the barrel.

A short time ago it became necessary to make this measurement, which had not been satisfactorily accomplished by Springfield Armory before. An apparatus was arranged to do this by electricity, using a spark coil, with primary and secondary circuits carefully balanced as to inductance and capacity. The gun was suspended by two wires so as to be free to recoil, and a spark point was attached to the gun so as to move close to a sensitized strip of paper when the gun recoiled. An insulated thimble was placed around the muzzle of the gun, and a wire was stretched across so as to be in position to be broken when the bullet came out. With the gun at rest, a spark was caused to jump from the spark point to the sensitized paper, thus marking and index point. The gun was then fired. As the bullet passed the muzzle, it broke the wire that was stretched across, and another spark passed to the sensitized paper, making a mark that showed where the gun was at that instant. The distance between this mark and the index mark is the amount of recoil which occurs before the bullet leaves the muzzle. This method is very accurate, as the electrical lag, or variation in the time required for the spark to jump after the bullet leaves the muzzle has been calculated to be less than one fifty-thousandth part of a second. This measurement for the Springfield Rifle gives a recoil of about seven one-hundredths of an inch. This figure agrees very closely with the calculations, when not only the weight of the bullet, but of all other accelerating factors, such as the weight of the burned powder gas and of the column of air in the barrel in front of the bullet are considered.

In all types of guns the recoil is a more or less disagreeable characteristic, but in many cases it becomes something more serious; it becomes the limiting factor in their ballistic possibilities.

All cannon have special and sometimes very ingenious and complicated mechanisms for absorbing the recoil. The excellence of its recoil absorbing mechanism is one of the greatest points of superiority in the French 75. With a poorly designed recoil absorbing mechanism, a field piece is inaccurate, for as soon as the gun is fired the shock of recoil is at once transmitted to the wheels and carriage, and the result is that the gun jumps or the carriage moves. Then the gun must be aimed again before another shot can be fired. With a good recoil absorbing mechanism,

a field gun gains in accuracy and speed, for when the gun is fired, it is free to move practically without restraint at first. When the shot is fired, the recoil is transmitted to the gun, but not to the carriage. The gun moves back, but the carriage stays put. The recoil mechanism gradually slows down the recoiling gun, and transmits the strain to the carriage so gently that its position is not disturbed, and the piece is all ready for another shot as soon as it can be loaded.

With pistols and shoulder rifles no type of mechanism for reducing recoil is in general use, though many inventors have turned their efforts toward the production of a device for this purpose. Two devices of this nature from the Museum at Springfield Armory are shown in the photograph.

Now as to recoil in connection with small arms of automatic design. The silencers reduce recoil to a certain amount, especially on high power rifles, but they are not in general use to any great extent. Some of the automatic or self-loading rifles are supposed to absorb a part of the kick by reason of the motion of their recoiling parts. In many of these guns this is not so. They may, and often do, kick much harder than if their mechanism were to be locked so that it could not operate. This easily can be explained. For example, a certain selfloading rifle weighs about seven pounds. As we have seen above, the more a rifle weighs, the less it kicks. But in this particular rifle, our calculations would fail if we used seven pounds as the weight of the gun for the purposes of resisting recoil, for the gun as a whole does not stand up against the kick of the bullet and help absorb the shock. The barrel and breech bolt are locked together and held in the frame of the rifle by a spring, so that they are free to move back several inches, independent of the rest of the rifle, when the gun is fired. The barrel and breech bolt together weigh only about half the total weight of the rifle. When the gun is fired, the stock and frame of the gun stand still against the shoulder, while the barrel and bolt, with their 4 pounds of weight, are alone opposing the kick of the explosion. For the purposes of kick, you might almost as well be firing a four pound gun. The lighter the parts are that oppose the thrust of the explosion, the greater is the energy absorbed by the parts, so that in the gun under consideration, the light moving parts, driven backward inside the frame of the gun, take up a heavy load of energy from the recoil and then come to a stop against the inside of the receiver and transmit the energy through the stock to your shoulder. The result is that this gun has a particularly vicious kick. Shooting this rifle is what first called our attention to the fact that in a self-loading gun the whole weight of the piece is not utilized to check the recoil. We checked up our reasoning in this matter by firing two well known makes of self-loading and auto-loading rifles in a recoil measuring dynamometer. We first fired the gun as a self-loader, and measured the recoil, then blocked the recoiling parts of the gun so that the self-loading action could not operate, and repeated the tests. In all makes it was found that the recoil was very much reduced by blocking the recoiling parts so that they could not move independent of the rest of the gun.

The same thing that causes the semi-automatic rifles to kick so badly also accounts for the rather

disturbing recoil of the automatic pistol. You can easily verify this by shooting one with the slide blocked, and notice how docile it is. The inventor of the new automatic pistol that one of the large arms companies has just brought out takes this fact into account, and controls the recoil very nicely by allowing the thrust of the explosion to act on the slide through only a very small portion of an inch of motion, after which the breech bolt is securely locked so that no more motion is transmitted to the slide. The momentum that the slide has already acquired is, however, utilized to operate the rest of the mechanism. By thus controlling the length of time the thrust acts on the slide, the designer has arranged so that the momentum transmitted to the moving parts is just enough to operate the mechanism, but not enough to cause a disagreeable kick.

One of the most startling guns, as far as kick is concerned, is a combination shotgun and rifle of English make. From the breech to within a few inches of the muzzle it is a smooth bore; from that point on to the end it is rifled.

There are two kinds of cartridges furnished. One is the regular shot cartridge, but the other is a special load, containing a lead bullet the full size of the 12-gauge shotgun bore. The theory of the thing was that if you were out shooting pheasants and you should happen to meet a bear, you could withdraw your shot cartridge and give Mr. Bear the *coup-de-grace* with a 12-gauge lump of lead.

It is not certain however, that the idea is a brilliant one, if it has to find its solution in a barrel smooth-bore at the breech end and rifled at the muzzle. After firing the contrivance just once, most people are not sure whether they'd rather face a bear or stand behind this gun. The way we interpret the performance is as follows:

(a) The gun is fired, and the bullet starts off down the smoothbored part of the barrel, shoving the gun back against your shoulder and giving you a vigorous kick.

(b) The bullet strikes the rifled part of the barrel near the muzzle, and the resistance of the rapidly moving mass of lead striking into the rifling causes it to jerk the gun away from your shoulder.

(c) Then, when the gun has been pulled away from your shoulder, and you are off your guard for more violence, the bullet comes out of the muzzle, and lets go of the rifling; at the same time the blast of gas rushes out against the air and drives the gun back, making it kick you worse than before.

Whether or not our interpretation of the mechanics of this kick is correct, there is one thing sure; and that is, that when you shoot the gun, your head gets snapped like the cracker on a whip.

Bad as this gun kicks, there is one that kicks worse. It is an automatic rifle that an inventor once brought in for test. It was made on an unusual principle. The breech block was not locked to the barrel at all. Instead, it was firmly fixed to the stock, while the barrel was free to slide forward against the action of a spring. When the gun was fired, the pull of the bullet in the rifling caused the barrel to jump forward, leaving the stock with the breech block attached to it, standing still. The empty shell also re-

(Concluded on page 7)

Down the Smokeless Powder Line

By C. S. LANDIS

(Conclusion)

FROM the plant wherein the powder undergoes the "water dry" process the grains of explosives are run over to the "dry house" proper. Here the powder is placed on screens covered with cheese cloth and is spread out in layers 1½ inches thick. It is then subjected to a temperature of 130° F.

The sight-seeing party is very carefully steered into the dry house while the assistant superintendent with his usual courtesy stands by to let them precede him. Not expecting to find anything more than another step in the manufacture of powder and besides having a rather "gone" feeling around the belt due to the ether fumes, no one noticed the backwardness of the host so we boldly stepped in remarking that "it was hotashellinhere, and then hastily and quite ungracefully ran out choking and gasping for breath with all the energy of a "gas" case due to the fumes of the chemicals that filled the place.

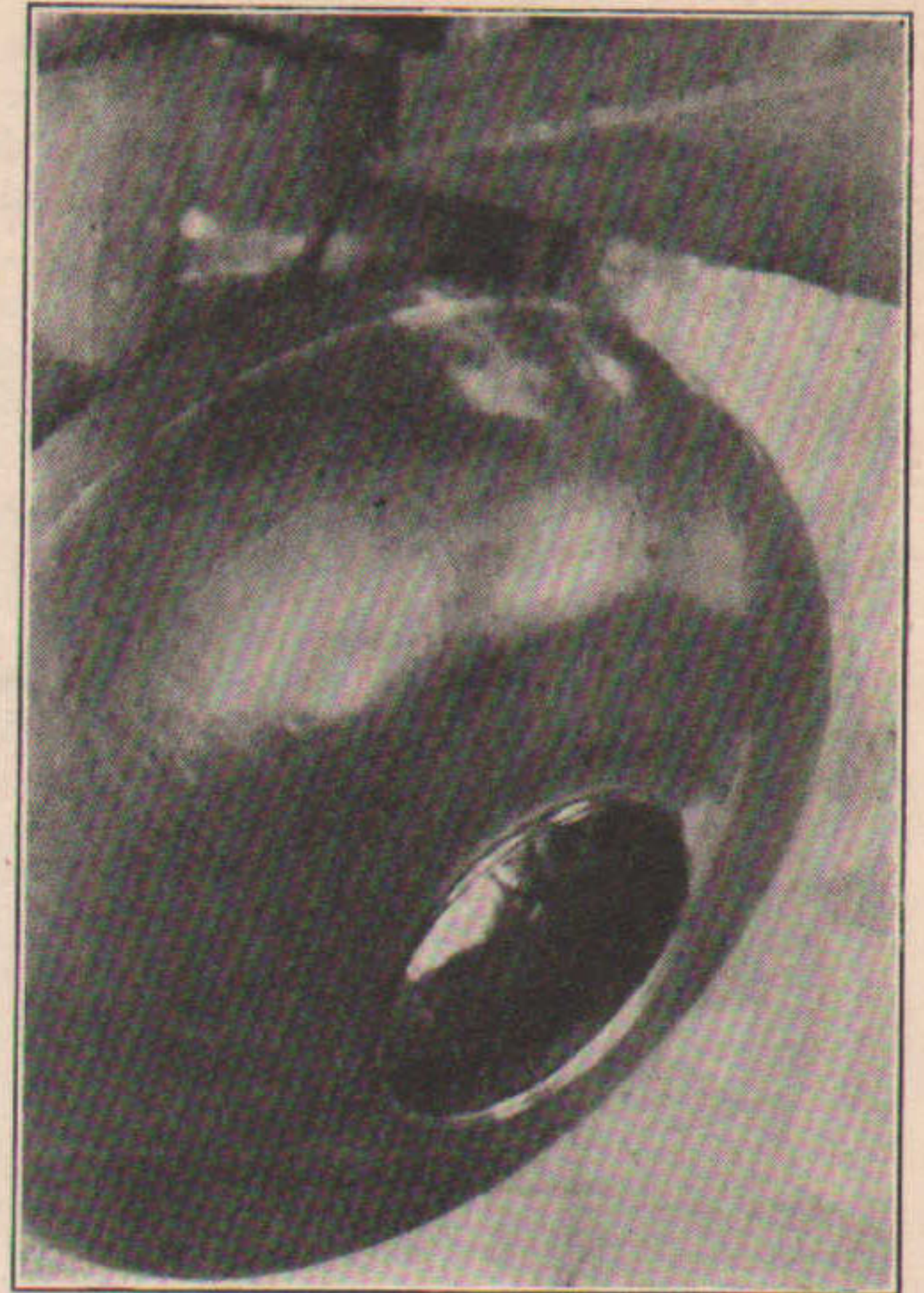
Gases at 130°F are usually quite active. Meanwhile we noticed our host doubled up with mirth, for he had very carefully kept outside.

There is some "kick" to this powder maker's jokes.

After having recovered somewhat we were very solemnly told that the powder is kept in the dry house from four to seven days and is tested each day after the fourth to see if it contains the proper amount of moisture.

From the dry house the powder goes to the glazing barrel, a copper kettle about six feet in diameter and 3½ feet deep. It is fitted with ribs on the inside that cause the powder to be kept in motion when the kettle is revolved. A charge of 1,000 pounds of powder is taken from the storehouse and placed in the kettle. Three pounds of graphite are then added and the whole mass is revolved together about three hours until the powder is thoroughly coated with graphite. The powder is then taken to the Sieving House.

In the sieving house the powder is sieved through screens to remove any grains which may



One thousand pounds of powder are placed in the Glazing Barrel. Three pounds of Graphite are then added and the whole mass is revolved until the powder is thoroughly coated by the Graphite to keep it from absorbing moisture and to allow it to run easily through the cartridge loading machines.

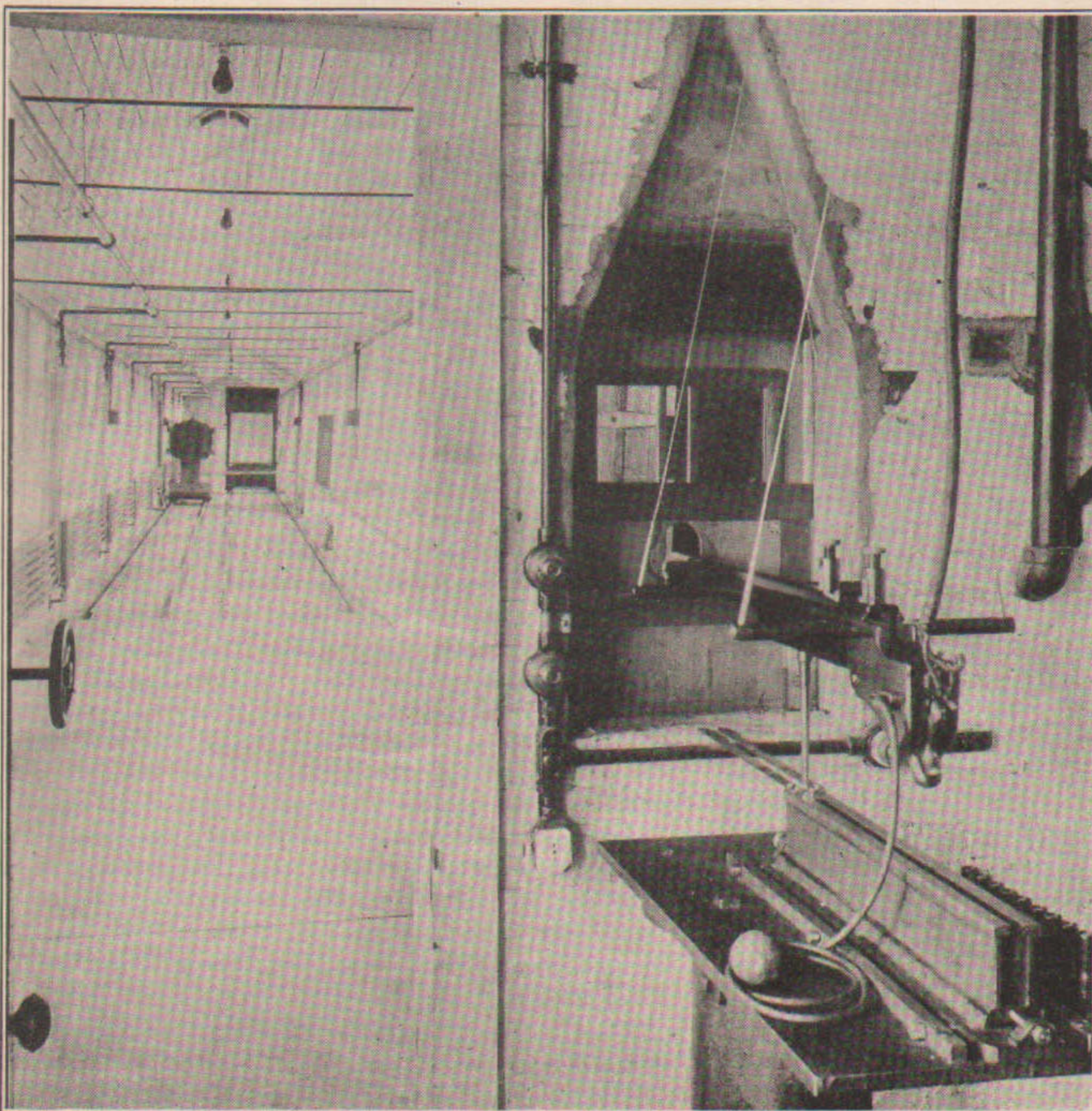
be too large or too small. The screens are arranged with a large mesh screen on top and a finer mesh screen beneath it. All powder that passes through the large mesh screen and does not pass through the small mesh screen is accepted and is taken on down the line. Only a very small per cent of particles will not pass this test, due to the accuracy of the pressing and cutting processes.

The next step is the preliminary blending. The powder from different lots is blended together so that any part of the lot may give ballistic results equal to any other part of it. If this were not done velocities would vary and the long range rifleman would speak in very uncomplimentary terms about the pit boy who would persist in marking up high and low 2's and artillery bulls on bullseye holds.

The blending house contains a barrel exactly like the glazing barrel and it works on exactly the same principle. Ten bags of one of the Pyro rifle powders containing 100 lbs. each are placed in the barrel at one time. After being charged the barrel is revolved for five minutes and the powder is thoroughly mixed, and then labeled out into ten 100 lb. bags.

After ten charges of 1,000 pounds each are run through the preliminary blending they are piled on separate piles of ten bags each on the floor of the blending house. In the final blending one bag is taken off each pile of ten bags, dropped into the barrel and then the barrel is revolved until there is no question about their being thoroughly blended.

After the whole of the 10,000 lbs. is blended the powder is taken to the packing house.



One of the shooting galleries. A shotgun pattern testing sheet is shown on the carriage on the right and the rifle target to test both velocity and accuracy is shown on the carriage on the left. These carriages are moved up and down the tracks and allow the targets to be placed at any distance from the gun allowed by the length of the range. The gun shown on the right in the photograph is a Webley Velocity pressure Gun for testing shotgun powders.

During the process of blending samples are taken at regular intervals from the lot and taken to the Ballistic Station for complete chemical, physical and ballistic tests, but, more of that later on. We must save the desert for the end of the story.

The first step in the packing house is to screen the powder to be sure that no particles of foreign matter such as metal, wood, ravelings or other objects have dropped in since the previous screening.

After being screened, the powder drops down a hopper, from the bottom of which it is weighed out into canisters and kegs for shipment.

After being packed the powder is stored in magazines until it is shipped to the loading companies or to the wholesale trade.

The Ballistic Station consists of a low, narrow building about 165 feet long that parallels the D.L.&W.R.R. at the north end of the property and we make for it with all of the joyful anticipation felt by a bull pup who is two feet behind his victim—and gaining.

The first person we meet at the Ballistic Station is the Ballistic Engineer of the Company. Noah Webster says that "a ballistic engineer is a person learned in the science of ballistics" but this definition is evidently caused by the fact that Noah was not acquainted with any ballistic engineers or he would have known that a ballistic engineer is first of all an incurable gun crank who works at his hobby. After getting that idea firmly impressed upon us we can add Mr. Webster's definition. The thing that impresses the visitor is the fact that a ballistic engineer takes as much pride in his gun room and his shooting range as a small boy does in his most highly prized Christmas present.

The first stop in the Ballistic Station is the Gun Room where one or more specimens of just about everything used in the rifle, pistol and revolver line are lined up in cases ready for use in the machine rests. The sight of case after case of rifles of all imaginable types captivates the party who proceed to handle several dozen rifles including, of course, the new models not to mention some two dozen Bolsheviki and other

foreign types of Mausers of queer appearance which are seldom seen in this country. In addition to these, Browning, Colt and Lewis machine guns and shotguns enough to bankrupt any ordinary gun crank are noticed. After this we drift over to the shooting gallery where the machine rests and pressure guns hold forth. Here are located the machine rests that hold the rifles in testing them for velocity and when necessary at short range for accuracy. Three 160 foot shooting galleries that are entirely enclosed and heated with steam furnish the setting for innumerable tests in working up loads for the various types of cartridges.

When a lot of powder arrives from the powder line the chemists first test it for gravimetric density, specific gravity, size of grain, number of

grains per pound and a number of other things that proceed to show if that lot of powder is up to the standard from a physical standpoint.

Samples of powder are tested very carefully for stability to be sure that the powder will keep for years, whether loaded or unloaded. This is necessary to protect customers who live in out of the way places hundreds of miles from the loading plants and who must have cartridges that will stand the test of time.

Tests for stability are of great importance and are always carried out in a very thorough manner.

Other samples are loaded in various cartridges and tested on the range to see if they give the standard velocity and pressure in the cartridges in which it is to be used.

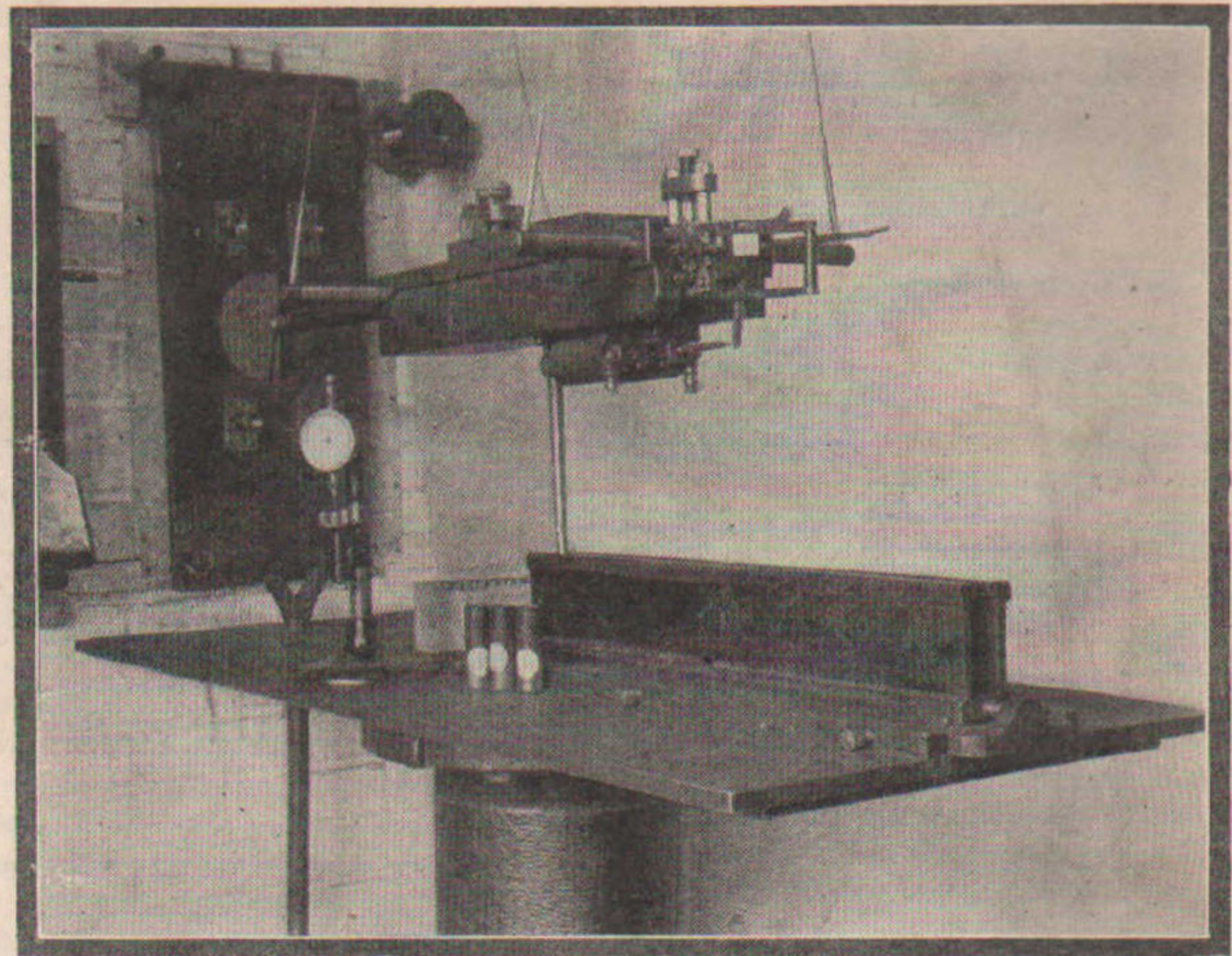
The charges are all weighed carefully on very sensitive analytical scales and then loaded in new brass cases. No cartridges are ever reloaded in the Kenvil Plant. No powder loads are measured for rifle or pistol cartridges.

All loads are tested in a standardized rifle for that caliber, in other words they are tested in a rifle that has been tested for standard velocity with a standard lot of powder.

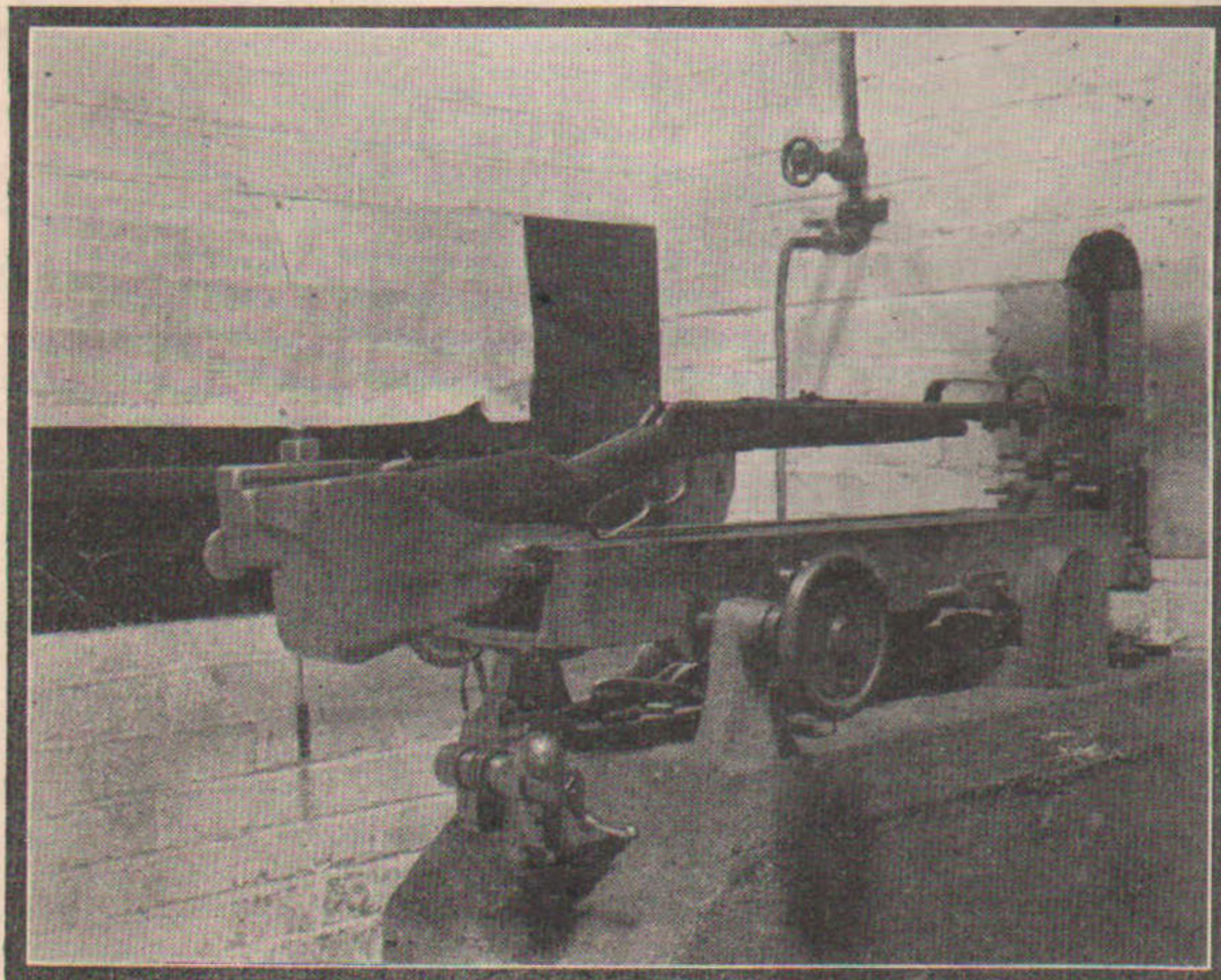
Rifles of apparently exactly similar type, caliber, length of barrel, size of bore, etc., will vary 5 to 10 F. S. in the average muzzle velocity that they give above or below the standard for that caliber. Each rifle used for testing velocity is tagged with a little tag stating exactly the results that rifle gave when tested with a standard lot. This small plus or minus quantity is added to or subtracted from all tests held with each rifle or otherwise a perfectly normal lot of powder would often be condemned for faults it did not possess, or what would be considerably worse a lot that gave higher or lower than the standard velocity would be accepted as being standard when it was not standard.

In looking over ten or twelve star gauged Springfield rifles, we notice tags reading 2630, 2635, 2640, 2645 on the various rifles which show their variation from the standard velocity of 2640 F. S. at 78 feet which is the accepted standard velocity for the Springfield rifle. This means that if 50 or 100 rounds were fired from one lot of powder with the same powder charge in each rifle that rifle No. 1 would average 2630 F. S.

(Continued on page 10)



The photograph shows a Baker Velocity Pressure Gun in which shotgun powders are tested for velocity and pressure



When samples of powder reach the Ballistic Station they are tested for velocity and pressure. The cut shows a Winchester Rifle in a Machine Rest ready to test powders for velocity

The 250-3000 Savage Bolt Action

By Capt. T. K. LEE



Top—The rifle speaks for itself. Center—With bolt removed. Bottom—Bolt in rear position.

IT'S a brand new creation from muzzle to butt plate. I may appear to be over-enthusiastic about it in this article. If so, don't criticise me until YOU shoot it. It weighs a scant 6 pounds and shoots the well known 250-3000 cartridges, about which no comment is necessary. The barrel of the 1920 is exactly the same as the older '99 model, beautifully tapered and balanced. Front sight base is integral with barrel. A pistol-grip worthy the name and a credit to its designer is there, checkered and capped and the forearm is likewise checked. Stock is all one piece, dull oil finish. Butt plate and trigger are corrugated. Sights, open, the rear being of the flat top style, a very good one for hunting in the woods. Magazine is of the double-column type, on the order of the Springfield, holds 5 cartridges, and with one in chamber makes 6 in all.

The bolt is very simple in design and excessively strong. It cocks on the opening motion and owing to its exceedingly short throw,

is the speediest high-power bolt action rifle made. May be loaded with clips if desired, or singly. Bolt is removed by simply pulling back and holding down trigger at the same time. The unusually large amount of metal in the receiver ring where the locking lugs of the bolt engage gives this action a greater margin of strength than it possessed by any military bolt action made. Action is positively locked from firing until bolt is completely closed. The camming action of the bolt as it is rotated on the opening motion makes for easy and positive extraction. Cocking piece has a knob by which it may be cocked by hand if desired. The bolt handle engages with a heavy shoulder of receiver when closed, adding further strength.

The design of magazine permits the use of the softest nose bullets without fear of deformation from recoil. Trigger has preliminary take-up found on military arms usually, and final let-off is exceedingly quick and pleasing. A strong safety of the shotgun type is mounted on upper

The Question of Recoil

(Concluded from page 4)

remained behind with the breech block and the rest of the works. The gun was made up for a full service charge, and it worked all right, but one shot was enough. The kick of a mule was mild by comparison. The officer making the test wept from his eyes and his ears and his nose all at once, and told the inventor that he would have to do any more shooting that he wanted done. It seems that one can get used to anything, even the kick of a mule, for the inventor explained that he was "used to it" and proceeded to fire forty or fifty shots with no unusual signs of discomfort.

The most radical method of attacking the problem of gun recoil is that adopted by Commander Cleland Davis, U.S.N. in his non-recoil cannon. In this weapon the recoil of the gun is absolutely done away with by the unique means of making the gun shoot both ways. The

back of the gun is open as well as the front. The projectile is placed in front of the powder charge, and behind it is placed a load of lead dust and vaseline of a weight equal to that of the projectile. When the gun is fired, the forward push is exerted against the shell and the backward push is exerted against the charge of lead dust, while the barrel of the gun, not being acted on by these longitudinal forces, remains stationary. This gun has the obvious disadvantage that it is just as dangerous to be behind it as in front of it. The operator must stand beside the gun, not behind it. The rear end blast of the gun is not dangerous at any great distance, however, for the lead dust loses its velocity so quickly that at a few feet from the gun it will not penetrate a sheet of paper. The gun is awkward to handle, because the breech sticks out as far to the rear as the muzzle does to the front. Besides, great care must be exercised as to just where the breech is pointing when the gun goes off, for the blast would be destructive to anything at close range.

tang, where a safety should be. It locks the sear from disengagement with the cocking piece and likewise locks the bolt from opening.

The Savage folks have certainly made a happy achievement in the design of this stock. The proper proportioning of forearm, pistol grip and dimensions of the comb lend to the rifle an exquisite grace and "feel" that permit lightning speed in manipulation and accurate shooting. No rifle I have ever held in my hands can match it in this respect. There is nothing to be found about it for the most critical critic to hang crepe on. The correct distribution of weight make it hold as steadily as an arm of 25% more weight.

As a hunting arm, nothing can equal it for all-round desirability. The 250-3000 has slain such insects as elephant, lion, rhino, hippo, gorilla, etc. While if it is desired to shoot such game as fox, rabbits, etc., the solid bullet may be used with good results and no mutilation of game. It represents the very latest development in bolt-action high-powered rifles and is but another convincing argument that American firms CAN turn out the best rifles in the world, at a cost several times less than foreign ones can be purchased for.

For quick first shots it is a wonder, the same as it is for snap shots. It seems the target can be covered almost instinctively and I'm spoiled for the "feel" of any other rifle. A trial with it will prove a revelation to the user of the old clubby feeling arms of other days. The accuracy of this arm is better than the '99 model, doubtless due to the one-piece stock and solid frame. At 100 yards we had no trouble in making 3" groups. This, of course, is not the possibility of the cartridge under better conditions, such as with peep sights, sling strap, etc. It has a practical point-blank range of over 300 yards. As practically all big game is killed possibly under 100 yards distance, the matter of sight adjustment so far as elevation is concerned can be forgotten. Top of receiver is matted to prevent light reflection.

The rifle will be on the market in late summer of this year, according to latest plans.

This gun has not been very extensively used owing to these practical difficulties.

The use of machine guns for arming airplanes early in the war called attention to the desirability of reducing the recoil of these weapons, with the result that the Lewis guns adopted for airplane use embody a recoil check. This consists of a short disk held in front of the muzzle, with a hole through it for the bullet to go out. Its back surface is curved, and the gas, striking this, is deflected to the rear. The reaction of the gas on the back of the disk pushes the gun forward, and thus checks the recoil. This has a noticeable effect, and many thousand guns fitted with this device were used during the war. So far as is now known, this is the only recoil reducer that has been used to any extent on small arms, and even this was not on a shoulder rifle. If the past is any indication as to the future, we have no relief in sight for the kick of the gun but to "grin and bear it."

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 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.

THE HUB OF THE WHEEL

ANNUAL competitions shot on the open range with the .22 calibre rifle, at distances up to 200 yards, will make it possible for civilian rifle clubs in the future to build their organizations about the small-bore outdoor range instead of around the small-bore indoor range as in the past. To make the outdoor small-bore range the hub of the wheel about which rifle club activities revolve is the logical course and one which if generally adopted will add greatly to the possibilities of rifle shooting in the United States, making the establishment of rifle clubs and their maintenance a much more simple problem than heretofore.

During the past five or six years, through which period the maximum development of rifle shooting as a sport in the United States has been apparent, the policy among rifle clubs has been to establish a range, with the regulation distances up to 1,000 yards whenever possible, and when such a range was not feasible to equip a shooting gallery in some unused cellar amid surroundings which were often so unprepossessing that only the out-and-out rifle crank could ignore them and attempt to hold together a few of the faithful. In many parts of the country the establishment of regulation rifle ranges by rifle clubs has been found impracticable; nor did the issue of outdoor range equipment by the government solve the problem, the chief obstacle lying in the way of establishing such ranges being the difficulty of obtaining a tract of land which would have the topographical characteristics demanded for full-charge shooting and which at the same time would be safe and accessible. When clubs in the past have organized and found the establishment of an outdoor full charge range impracticable, the only alternative—that of confining the club shooting to an indoor range—has been far from a satisfactory solution of the problem. Shooting on the indoor small-bore range is admittedly better than no shooting at all, but even

when an indoor range is well lighted, well constructed, clean dry, and well equipped, the limitations which it imposes upon any shooting program other than the monotonous shooting at black-and-white bulls-eyes at fixed distances has in many instances operated as a damper upon club enthusiasm. And so while practice on the open range with a service weapon is the most desirable basis for club activities, and while the establishment of indoor ranges for .22 calibre shooting made small arms practice possible in the absence of outdoor facilities, neither system can be regarded as answering the demands of a live club membership, or as being the hub around which the shooting game should revolve.

On the small-bore outdoor range all conditions that existed on the outdoor regulation range can accurately be simulated, and it is possible to add many attractive features in the nature of special programs, with now and then a competition which gets away from the inanimate and monotonous black-and-white bulls-eye. Also there are few parts of the country where a 200 yard range cannot be established in some locality easily accessible to rifle club members and with a due regard to the safety and the rights of others.

Every rifle club in the United States that has not already taken up .22 calibre shooting on the open range, should immediately prepare to institute this type of shooting. Any rifle club which at present has access to a 200-yard range, or even a 100-yard range will have no trouble trying out the new small-bore practice.

Those clubs that have not enjoyed the privileges of an outdoor range should lose no time in locating a site. The Small-Bore Committee of the National Rifle Association has already undertaken to acquaint rifle clubs and shooters generally with plans with regard to small bore shooting during the coming summer. Full instructions as to courses and working plans for the construction of ranges, varying from the type which any rifle club can put up at little expense, to those of the type which may be desired by well-established and financially-solid clubs, will be mailed to all riflemen within a short time.

ONE-MAN LAW

ONE of the worst enemies of wild life is the prosecuting attorney who is not in sympathy with the game laws. Through a false self-inflation of his importance, he often acts as though he were invested with the power of legislators, judge and jury all in one. On other occasions he is simply playing politics in refusing to prosecute a case laid before him. If he can satisfy his political backing and no one takes offense, why should he not continue to do as he pleases? Along with him is the local justice of the peace who takes the plea of guilty and, because of friendship or some other reason, assesses a fine of \$1, although the law says plainly that the fine for first offense shall be \$25.

The fish and game commissions in nearly every state can tell you where both of these individuals can be found. Often through bitter experience they have learned the habits of the species. There is nothing more discouraging to the man entrusted with the enforcement of the game laws than to secure a good clean-cut case against an individual needing punishment and then have the violator released by the prose-

cutting attorney whose duty is solely to try and secure conviction in all cases where the evidence is sufficient.

This man can often be handled from higher up, if the proper interest is taken in the matter, but whether this is possible or not, he can be reached in another way. A good live sportsmen's organization can make him come to time in short order. He is sensitive to public opinion as most politicians are. Without doubt, he has higher aspirations and can be made to see the light. Public sentiment is in favor of game law enforcement and little trouble will be encountered in showing such officials

that the sportsmen of a community carry a great deal of weight.

If you are going to have any shooting in your section, you must help protect the breeding stock you now have. Form a sportsmen's club, or, if there is already such an organization in your community, join it to-day. Put your weight behind the movement to bring the guilty to justice. Individual interest is always commendable, but where a matter is of import to the entire community, concerted action is what counts and organization is essential.

Hunting With the .22 Calibre

By "RIPLEY"

FOR many years I have had a great respect for the .22, but until this season I had given little thought to it as promising any sport with larger game than rabbits and squirrels, though I had used it with much satisfaction in the duck blind. It solved the problem of stopping effectually crippled ducks at distances and when I did not want to use the shotgun, and in a few instances served me as well on Canada geese.

My first real effort on geese with the .22 long rifle cartridge was in flight shooting. At first I was by no means successful and, though I had many opportunities during my early attempts, my marksmanship was below requirements. I discovered this was partly due to the trigger pull, as well as my difficulty in gauging distances to lead. I did not want to disturb my trigger pull, so I adapted myself to it and confined my next goose hunting to direct overhead shooting. That evening I killed six big Canadas and a white front. Out of how many shots I can only estimate—but I am sure I must have fired twenty-five times.

This experience brought to me a greater love for the little arm and I determined to give it more opportunities. Two running gobblers were stopped at 70 yards. I considered this quite a splendid feat, as my turkey country was badly grown up in switch cane, briars and second growth hardwoods—and a turkey appeared quite small at that distance. But my old habit of snap shooting took hold of me and I succumbed after I could get on turkeys better and, as I reflected after I had killed a fat incoming hen flying overhead when I was in the center of Current river in a johnboat, that no sights suited me for all around shooting better than any open sights I had ever used.

A few successes started the idea germinating in my mind of killing larger game with the .22. The ease with which I brought down an immense coon for a night hunter who pointed it out to me in the top fork of an extremely large sycamore determined me to try out the .22 on larger game.

Two things I was sure I would have to feature in my hunt; I would have to get closer to game; I would have to depend more upon woodcraft. The game I had in mind were deer and timber wolves.

Automatically deer hunting suggested itself to me first. It seemed feasible not only from tales I had heard about the experience of others, but because not long ago I found a nice buck dead in the Black river swamps. The only wound I

could find was about six inches from the heart. After digging around in it with my pocket knife I brought forth a B.B. shot. The closest scrutiny over the entire body failed to disclose anything else that could have produced death. Further contemplation assured me that to secure such penetration of the round pellet the hunter had to be quite close. *Moreover it taught me a lesson against shooting with a small caliber arm at any game which I had the least reason to believe was out of killing range.* In many instances it gets away without any signs of being wounded, only to die many miles away from the scene of the shooting.

My first day I was unable to get what I thought was close enough to a deer, though I saw four, my stalking did not put me as near as I wanted. A fine sleet blew out from the northwest and continued through the entire day. I worked against it. While beating against wind in Bog Hollow a sink between a chain of hills, I felt positive of starting a deer among the big flint rock boulders. It was a favorite place for old bucks to bed and out of the way for anyone but native hunters, who had given up the sport entirely since the anti-hound law.

I saw three old beds now partly sleet covered. I became cautious, moving with the greatest care and looking ahead for the slightest signs. I had almost attained the point where the hollow terminates abruptly against a steep hill. I heard a faint scraping of the rocky underfooting. All at once a good sized buck stepped out from behind a big boulder not over twenty-five yards in advance of me, presenting a good view of its left side.

Instantly I fired.

The buck dodged behind the rock and simultaneously I heard a shower of flint rock, ample proof that the buck was going at a speedy clip up the hillside. I was unable, however, to see it, owing to the tremendous height of the grasses and interposing second-growth post oak saplings. When the last echo of the hoofs on the hill died down, I proceeded on to see if I could find a sign that I had made a hit, though I felt certain I had missed cleanly, for the storm was pelting sleet at its worst.

When I got around the boulder I saw that the buck had jumped twice and turned around two others. At the foot of the third boulder I found him laying dead across a small pine log. I had made a hit very close to the heart, and what I took to be him crossing the hill was another deer that had been started by my shot. Twenty

yards further I found his bed, and to the touch of my hand it was still warm.

After killing my first deer I began to feel a little more confidence in the small arm. Wildcats attracted my attention, and though I saw plenty of signs I was unable to find them. The dogs that I had could drive them pretty nicely, as well as start them, but when they broke from the underbrush and went to the higher altitudes where they jumped from rock to rock, they were always able to loose my hounds.

Nearer home there was a chance to try the .22 on timber wolves. They were plentiful and the dogs were invariably able to start one or more any time, and I was well acquainted with their run. It was generally straight east over the ridges, through a long hollow, and then on for the Red Sea overflow where they lost the dogs in the immense inundation.

It was after a snow fall when a native started driving with the dogs. They put one up and I ran to an old tram where I felt sure the beast would cross. As the wolf came toward me he caught sight of me at two hundred yards, but much to my surprise another had started though the dogs failed to leave the first for the trail of the second. He swung for the tram road and came within sixty yards of me when I plunked him in the side with two shots. In a fraction of a second he went over the ridge north of me, so followed in all haste, expecting to find him down somewhere on the north slope. The country was simply broken up with small hills, a case of down one and up another.

When I crossed the hill I found where the wolf had fallen. He had staggered around considerably before he managed to get to his feet. In the snow I could see that two jets of blood were spurting freely; surely I would find that wolf on the next slope. Continuing on the trail I found where he had performed as before, but I got no glimpse of him.

Across the next ridge I discovered where my wolf had rested. The blood was not flowing so freely, but the signs showed that he had experienced as much trouble as before to get to his feet. I followed that wolf for five hours in the snow and not once did I catch sight of him. He was always just over the next hill. Finally I abandoned my chase after blood stopped flowing. Here the country was grown up with young post oak thickets and there were so many wolf tracks I was totally unable to distinguish those of the wounded one from the others.

I had to give up wolf hunting for the balance of the day, not only because I was pretty well tired out, but the dogs went way out of hearing and did not return until that night. They were all pretty well scarred up and looked more like

Announcement

THE MANUFACTURING & SALES CORP.

Oliver L. Badger, *President*

has purchased the business of
THE KERR ADJUSTABLE STRAP CO., Inc.
and will continue same at the old address.

GUN SLINGS FOR ALL RIFLES

supplied to the trade.

Rifle Clubs and riflemen unable to obtain our slings from dealers may order from us.

The favorite sling of the Army, Navy and Marine Corps.

MANUFACTURING & SALES CORP.

40 Cedar Street
NEW YORK



Here They Are!

The new military rifle powders Hercules 300 and Hercules 308

These powders are specially adapted for use in the Springfield and Krag. For particulars address

HERCULES POWDER CO.

1005 ORANGE STREET
Wilmington Delaware

whipped dogs than those that had made a killing.

This stopped my wolf hunting for some time, but I wanted to get back after them, though it was a long while before I saw another. Early every morning I heard their chases and some times at night. I hunted hard but they were too wise for me. I took in every sheep and calf killing that occurred in the neighborhood, but invariably returned without seeing any.

There is a belt of woods in Ripley County, Missouri, which has been called for a half century Turkey Pen Hollow. I started across this big stretch of hardwood timber, promising a neighbor, who was ill, some squirrels. An old black hound accompanied me, a hero in many a wolf chase. As we crossed the hill in the center of the hollow Buster opened up cold trailing. Then he registered a strike and let out his drive notes as though a sight race was on. I ran to get a good view of the race. I saw a big gray loping slowly along the ridge, suddenly stop and turn to meet the advancing hound. Never before had I seen Buster display the white badge, but he did this time. He stopped, backed off then ran toward me. I was sure I knew where the big wolf would cross and ran for the hollow with all my might. As I gained the old tram road I tripped. I fell at full length. As I arose I saw the wolf staring at me about thirty yards away. But I still held my rifle and let him have a bullet in his side. He sprang in the air, performed a strange pirouetting act, all the while snapping at emptiness close to his paining side. I sent another bullet at him. All at once he dove

head foremost in the middle of the tram and the rested quietly.

He died without further struggle. I had shot him between the eyes, though I had aimed for his side. In the act of snapping toward his side the head had stopped the bullet, and in that manner I killed with a .22 the largest timber wolf that I had ever seen.

Smokeless Powder

(Continued from page 6)

for the 50 or 100 shots. Rifle No. 2 would average 2635 F. S., rifle No 3. would average 2640 F. S. etc.

Understand that none of these rifles are at all defective; not in the least. They merely give velocities that vary slightly from the *standard*. All of these small differences need to be taken into account in testing powder, because these little refinements of ballistic knowledge all do their bit to perfect ammunition so that it is possible for us to take ammunition from different bandoliers or different boxes and make possibles at 600 to 1000 yards without changing the elevation on the rear sight from one to five minutes in changing from one lot of cartridges to another. It is one of the reasons too why Bill Jones will use 72 minutes elevation while John Smith who shoots next to him will use 70 while using the same lot of cartridges at 1,000 yards. The main difference, of course, is always in the difference

in eyesight and holding. The two rifles are very likely almost exactly equal in accuracy and reliability and one is just as good as the other but they do not shoot into quite the same place due to these differences in manufacture. For the same reason different lots of powder of the same type will require slight differences in the weight of the charge necessary to give the same velocity and pressure. None except those giving standard velocities with standard charges, as printed on the canister labels, are ever retailed.

When a lot of cartridges are loaded up ready to be tested they are first tested for velocity by placing the rifle in a machine rest, loading it and firing the cartridges. The wire that is three feet in front of the muzzle of the rifle, and the back stop behind the target are both connected electrically with the chronograph.

When the shot is fired it first cuts the wire placed three feet in front of the muzzle of the rifle. This allows the long rod of the chronograph to fall. When it starts to fall it is nicked to give us a zero to measure from. When the bullet hits the steel back stop back of the target it cuts a second circuit which causes a knife edge on the chronograph to fly out and nick the falling rod which has been blackened with lamp black. The distance these two marks on the long falling rod when measured up and compared with a table gives the velocity in foot seconds.

Military rifles are tested over a 150 foot range. Small calibers and most hunting rifles are tested over a 100 foot range. Various charges of a lot
(Concluded on page 17)

Remington UMC "Indoor Target" .22 Long Rifle Lesmok Cartridges

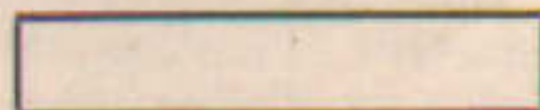


We take pleasure in announcing that we are now prepared to supply the shooting fraternity with a cartridge which will give surprisingly close and uniform groups at 25 yards indoors in .22 caliber target rifles.

This is the ammunition which was used by the Denver Team in making their phenomenal record in the N. R. A. Indoor League last season.

Boxes containing Remington UMC Indoor Target Cartridges have a special label pasted on the top of the box which reads "Indoor Target."

Order through your dealer who will supply you at the same price as our regular .22 Long Rifle Lesmok.



The Remington Arms Union Metallic Cartridge Co., Inc.

LARGEST MANUFACTURERS OF FIREARMS AND AMMUNITION IN THE WORLD

Woolworth Building, New York City

B. S. A.

Match Rifle



For the N. R. A. 1920 Indoor Matches

THE RIFLE THAT BEAT EVERY
OTHER SMALLBORE AT
CALDWELL

The
Production
Equipment
Company

5 Union Square
NEW YORK

CONVENIENCE

NOWHERE TO GO
BUT IN THE
CHAMBER

Success is made up of small details. One of them is lack of annoyance over the little things.

When you load your B. S. A. whether at the darkened firing point of the indoor range or in broad daylight, you merely put the cartridge in the groove on top of the block and give it a push, then move the lever up 2 inches and the rifle is ready to fire.



SHOOTING NEWS AND COMMENT



FURTHER details of the Olympic Games, insofar as marksmanship contests are concerned have been received in this country and have been transmitted to the committees of the National Board for the Promotion of Rifle Practice of the National Rifle Association and of the United States Revolver Association who are working toward the selection of teams to represent this nation at Antwerp next July.

A translation of the decisions made by the National Olympic Committee held in Paris, June 1914, has been supplied to these committees. These parts of the decisions effecting shooting are given herewith:

Shooting.

(Rules of the International Union of Federation and National Shooting Associations.)

Individual tests: National weapons; gun, pistol or revolver.

Choice of weapons: rifle, revolver or pistol. Deliberate fire, rifle. Quick fire (pistol or revolver). Running Stag, (single shot). Running Stag, (double shots). Clay pigeons (gun.)

Seven entries, five starters.

Test by teams: National weapon; gun (1st, 2nd and 3rd tests) and pistol or revolver. Choice of weapons: rifle, revolver or pistol,

deliberate fire, rifle. Quick fire (pistol or revolver). Running Stag (single shot). Running Stag (double shot). Clay pigeons (gun.)

(Seven entries, five starters.)

Tests in Detail.

1. Shooting with war rifle of the latest model, without modification or addition, of the competing nation.

For active members of the various armies and civilians. (a) Shooting competition by teams: Distance 200 metres standing, with hands free; 300 metres reclining (lying down) hands free, elbows supported.

For each distance each marksman fires ten shots. A marksman has the privilege of two trial shots. Objective: target of 170 x 180 centimetres, with concentric rings from 1 to 6.

(b) Individual Competition: Distance 300 metres kneeling, elbow supported or free, and lying down with elbows supported. Each marksman fires in 2½ minutes including time to load and change position, ten shots viz: five shots kneeling, then five shots lying down. He has the privilege of two trial shots. A marksman before beginning, stands erect, arm grounded, breach open, gun unloaded.

Objective: target of 170 centimetres x 140 centimetres, with concentric rings of 1 to 6.

(c) Shooting competition by teams: Distance 300 metres, lying down, hands free, elbows supported.

Each marksman fires, in the time of three minutes a series of fifteen shots. He has no right to a trial shot. A marksman has beforehand loaded his weapon and taken the firing position.

Objective: Fifteen moving silhouette heads 50 cm. wide x 30 cm. high at intervals of 1 metre. A bullet put in the head of the silhouette counts two points to the marksman; one point, in the other parts of the figure. Competition by teams: a collective shooting test to distances of 300 to 600 metres.

2. Ordnance pistol shooting or other hand weapons of ordnance used in the army of the competing nation.

For active members of the various armies or civilian marksman.

(d) Competition of individual shooting: Distance 50 metres aimed standing with hands free, arm stretched out and without support. Thirty shots are fired in five series of six shots each. Two trial shots. At the time of the test the marksman stands erect, weapon loaded, arm lowered, the barrel of the weapon turned toward the ground.

Duration of fire: four seconds with interval of ten seconds between shots. Announcement after each series.

Objective: Human silhouette (figure) entire, divided into rings of 1 m. 70 cm. apart.

(e) Competition by teams: Distance 100 metres. Aimed as here above, 30 shots in five series of six shots. Two trial shots. A series must be fired during forty seconds counted after

(Concluded on page 14)



Charles Cottar's Score with the .250-3000 Savage—
ON LION—ONE HUNDRED PER CENT

.250-3000 Savage Rifle, take down model .22-inch tapered round barrel with integral sight base. Checked extra full pistol grip and forearm, checked trigger. Corrugated steel shotgun butt-plate. Commercial silver bead front and flat-topped wind-gauge sporting rear sights. Weight about 7 lbs.

Do you know how many hunters are killed or mauled by lions every year? Do you realize that the lion is the African travellers' and hunters' greatest peril?

Listen to what Mr. Cottar says about what the little .250-3000 Savage does to the king of beasts:—

"On lions and leopards—I have shot a score of the two species with the .250, and some of them at less than a rod distance—not one escaped that was hit."

The power of the .250-3000 Savage makes lions as easy as leopards to the man who has used it on both. . And he has killed rhino, hippo, buffalo and elephant with it. Do you wonder that he finds it the most generally useful rifle for African hunting?

And don't forget it's a six-shot repeater that weighs only seven pounds—that it has a point-blank range of over 300 yards—that it is accurate enough to make possibles at 800 yards—and that it hardly kicks at all.

You can see it—handle it—buy it—at your dealers. For particulars, write us.

SAVAGE ARMS CORPORATION

Sharon, Pa.

UTICA, N. Y.

Detroit, Mich.

Executive and Export Offices: 50 Church Street, New York City



Shooting News

(Concluded from page 12)

the word "fire" has been given. A marksman is not required to shoot his series in immediate succession. Position of marksman as at beginning; same as for (d).

Objective: Same as for (d).

3. Shooting competition with choice of weapons:

(a) Free rifle shooting: forty shots in each of the three positions: standing, kneeling, lying down according to International target practice. For each position, ten trial shots.

(b) Match pistol shooting: 50 metres, sixty shots, international pistol target, ten trial shots. For each weapon (a) competition by teams.

(b) individual competition.

Results of group shooting are rated at the same time for individual competition.

5. Free Rifle Shooting .22 calibre. Deliberate fire as used at Stockholm in 1912. Rapid fire upon small silhouette (figures.) Pistol or revolver as at Stockholm. (30 metres, two seconds) upon small silhouettes.

5. Shooting of running stag. Hunting rifles of all makes: weapons of one barrel shall not exceed in weight 3 kg. 500 (not including aiming sight if one be used). (7.71 lbs.)

(a) Competition by teams to 100 metres, two tests: Single or double shot—Each team is composed of four marksmen with two extra substitutes; two trial shots are allowed.

(b) Individual: two test, same conditions as for team competitions.

6. Clay Pigeon Shooting.

The calibre of weapon shall not exceed calibre .12. Charge of lead shot 36 grains at most. Any position.

(a) Team competition: Each team consists of six marksmen with two substitutes at most.

100 pigeons at 15 metres in ten series of ten pigeons.

(b) Individual: Each marksman has 100 pigeons to shoot at 15 metres by series of ten pigeons.

After the 40th pigeon, half of the marksmen are eliminated; after the 70th, half of the remainder.

In case of a tie, the number of cartridges fired in the first instance; in the second place a match upon ten pigeons per marksman.

THE Maryland Casualty Company is writing bonds for rifle clubs for \$300.00, at the rate of \$3.00 per annum but no bond is made out for less than \$300.00. The Washington agents of this Company are Clark & Clark, Metropolitan Bank Building, Washington, D. C. A \$300.00 bond will as a rule cover all equipment issued to a rifle club by the Director of Civilian Marksmanship.

CAPTAIN Oliver F. Snyder, Ordnance Department, U. S. Army, has been assigned to duty in the office of the Assistant Secretary of War, as Assistant to the Executive Officer and Recorder of the National Board for the Promotion of Rifle Practice in the United States.

Captain Snyder has been a commissioned officer in the U. S. Army since July 25, 1900. He served for 18 months in the A. E. F. in France was in command of all the Army ammunition Depots and Dumps serving the First and Second Armies during the St. Mihiel and Meuse Argonne offensives, and was captain of the A.E.F. Pistol Team that won first place in the Inter-Allied individual and team matches in France after the armistice, and was only recently returned to the U. S. from Germany where he served as Chief Ordnance Officer of the Siberian Provisional Brigade.

Before the war Capt. Snyder was on duty in Washington as Military Instructor at St. John's and Gonzaga Colleges and Instructor of the Washington Police Force in pistol practice. He is one of the few officers that is distinguished with both rifle and pistol in the U. S. Army.

THE Pennsylvania State Rifle League is planning its schedule of matches for the coming season. The Fort Pitt Rifle Club of Pittsburgh, the University Rifle Club of Reading, the P.R.R. Keystone Rifle Club of Harrisburg and the Harrisburg Rifle Club, who formed the Pennsylvania State Rifle League in 1919, have elected league officers for 1920 as follows:

President, C. S. Landis; Vice-President, C. A. Dunn; Secretary-Treasurer, Paul H. Dillman.

A schedule of monthly matches from April until October has been arranged for. The probable course of fire will be ten shots time fire in one minute from the sitting position at the D target at 200 yards, 2 sighters and ten record shots from the prone position at the B target at 500 yards, 2 sighters and ten record shots from the prone position at 600 yards.

At every match, all members of each club are eligible to shoot. The five highest scores in each match constitutes the team for that club. This gives everyone a chance to make his club team each time he competes. Each organization in the state that has a suitable range is invited to join the league.

The two Harrisburg clubs and Reading Club are planning to shoot on each others ranges and thereby have more enjoyable matches. Lancaster, Pottsville, Allentown, Warren and others of the more powerful clubs are considering the proposition of joining and making the league the most powerful state rifle league in the country.

The Pennsylvania State Rifle Team for 1920 will require at least six new members, and the league matches will be based, as far as range facilities permit, upon the National match course. This will provide the training necessary to turn out a powerful state team.

Full detailed information can be obtained by addressing the Secretary, Paul H. Dillman, 22 North Howard Ave., Bellevue, Pa.

WAR-TIME ammunition has been made the subject of some little inquiry by R. S. Tichenor, Secretary of the Princeton, Indiana, Rifle Club. In recounting his experiences with cartridges of this vintage, Mr. Tichenor says:

"Since the Princeton Club received its supply of Springfield stuff too late in the season to do any thing at all on the range in the way of testing the ammunition for accuracy I have taken the matter in my own hands and have conducted a test, which does not show any real groups on the target, but at the same time will show most any recruit in the game what he may expect in the

ATTENTION RIFLE CLUBS

SOLVOL in one quart cans. Just the right size for use on the gallery cleaning rack. A trial can will be sent, postage paid, upon receipt of \$1.65.

Manufactured by
CAPT. BASIL MIDDLETON
Culver, Ind., U. S. A.

way of scores when he takes his *Starguaged* springfield and bandoleer of this war-time government issue model '06 ammunition to the range. The test:

"I unloaded fifty cartridges, which were made commercially on April 16, 1919 (after the war was over), and weighed both the powder and bullet taken from each shell on a pair of scales which are accurate to one-tenth of a grain, the weight of powder and bullet as taken from each shell follow.

Grs. P.	Weight B.	Grs. P.	Wt. B.
47.3	149.5	44.3	148.9
46.7	148.6	46.7	149.1
46.2	149.8	46.0	149.6
46.5	148.7	46.5	148.7
46.5	148.7	46.7	149.6
46.7	148.7	46.2	149.6
46.3	148.6	46.5	149.0
46.5	149.2	46.2	149.3
46.3	149.1	46.8	149.3
46.4	149.0	46.5	149.7

Grs. P.	Wt. B.	Grs. P.	Wt. B.
46.8	148.0	46.5	148.9
46.6	148.6	47.0	149.0
46.6	149.7	46.9	149.6
44.7	149.3	46.3	148.9
46.4	149.0	46.3	148.8
46.7	149.2	46.7	149.3
44.3	148.6	46.5	148.8
46.5	149.6	47.2	149.2
47.1	148.7	47.1	149.5
46.6	149.2	46.7	148.8

Grs. P.	Wt. B.	Grs. P.	Wt. B.
46.3	148.7	46.5	148.8
46.5	149.9	44.5	149.8
45.2	148.9	46.7	149.6
46.3	148.9	47.7	149.2
46.5	149.0	44.5	149.0

"By a close study of the above weights some idea may be arrived at as to the possible appearance of the score card after firing five strings of ten shots each.

"In addition to the variation in the weights of powder and bullets I noticed that some of the bullets were not crimped in the shell at all, being held friction tight while others were crimped, some much tighter than others, I also noticed a difference in the depth to which the bullets were seated in the shell. All of these things serve to make a lot of ammunition which is fairly good for rapid fire practice at 200 yards but that is about all you can say in its favor.

"This, no doubt, sounds like something of a kick not only against the makers of the ammunition but against the Government as well, but such is not the case, the writer is well aware of the fact that this ammunition was made on contract for the Government and that war-time tolerances were used; The only kick I have against the Government for issuing this ammunition to rifle clubs is that it is liable to cause some new man in the game to become disgusted with himself and his gun as well as the shooting game in general all because he was not able to make a qualifying score with this poor ammunition, some rifle club thus loses an otherwise good member and some secretary is noticed to have a few more grey hairs in his head.

"To the old timer in the shooting game this poor stuff merely furnishes amusement for some otherwise lonesome winter evenings for, as any BUG knows, all that is necessary is to pull the bullets from the shells, pour the powder out, re-size the neck of the shells, and reload them to suit his own ideas."

With the Small-bore League

WITH 211 clubs competing, the N. R. A. Gallery matches for 1920 are under-way, and the returns from the first week's shooting indicate that not only in point of numbers but in the excellence of scores, the matches this year will far outstrip all previous similar events.

The entry list shows that while 211 clubs have entered the events, the listing of more than one team from many of the organizations has brought the total number of contestants up to 230, easily topping all previous records.

Among the civilian organizations, 134 clubs are represented by 146 teams; among the colleges, 19 clubs are represented by 20 teams; among the Military Schools, 39 clubs are represented by 42 teams.

The first stage of the matches was completed on February 14, but the returns have been slow in reaching the N. R. A. offices, due principally to storm conditions which have held up the mails.

It has been possible however, to obtain a fair report of the results of the first week's shooting among the civilian clubs.

1. *Quinnipiac Rifle & Revolver Club*, New Haven, Conn.: W. H. Richard, 200; Virgil Richard, 200; A. A. Clouet, 200; H. J. Gussman, 200; Wm. Breuler, 199. Club total, 999.

2. *Denver City Rifle Club*, Denver Colo.: R. E. Ladwig, 200; L. G. Pridy, 200; Floyd Ridding, 199; D. C. McConaughy, 199; H. W. Beck, Jr., 199. Club total, 997.

3. *Bridgeport Rifle Club*, Bridgeport, Conn.: W. W. Naramore, 200; C. B. Naramore, 200; C. W. Vanstone, 199; G. Z. Smith, 199; R. E. Rose, 198. Club total, 996.

4. *Marion Rifle Club*, Marion Ohio: M. E. Carroll, 200; E. W. Imbody, 200; G. C. Whaley, 199; J. E. Plummer, 199; W. F. Court, 198. Club total, 996.

5. *Lakewood Rifle Club*, (1st Team), Lakewood, Ohio: M. M. Foster, 200; Geo. R. Liggett, 199; C. W. Woodyatt, 199; W. C. Andrews, 198; R. L. Rowe, 198. Club total, 994.

Club total.

- 6. Lynn Rifle & Revolver Club, Lynn, Mass. 994
- 7. Bangor, Me., Rifle Ass'n, Bangor, Me. 993
- 8. Brattleboro Rifle Club, Brattleboro, Vt. 992
- 9. Haverhill Rifle & Gun Club, Haverhill, Mass. 990
- 10. Boston Rifle & Revolver Club, Boston, Mass. 989
- 11. Santa Fe Rifle Club, Santa Fe, New Mexico. 989
- 12. Birmingham A. C. Rifle Club, Birmingham, Ala. 989
- 13. Ordnance Rifle Club, Washington, D. C. 988
- 14. Remington UMC Rifle & Gun Club, Bridgeport, Conn. 988
- 15. Butte Indoor Rifle Club, Butte, Mont. 987
- 16. Auburn Rifle Club, Auburn, N. Y. 985
- 17. Brooklyn Rifle Club, Woodhaven, L. I., N. Y. 985
- 18. Arlington Rifle & Pistol Club, (1st team) Arlington, N. J. 984
- 19. Pentwater Rifle Club, Pentwater, Mich. 983
- 20. Warren Rifle Club, Warren, Pa. 983
- 21. Dayton Y.M.C.A. Rifle Club, Dayton, Ohio. 983
- 22. Hillsboro Rifle Club, Hillsboro, Ohio. 983
- 23. Wisner Rifle Club, Wisner, Neb. 982
- 24. Centennial Club, Chicago, Ill. 979
- 25. Irving Park Rifle Club, Chicago, Ill. 979
- 26. Middletown Rifle Club, Middletown, N. Y. 979
- 27. Olympic Pistol & Rifle Club, San Francisco, Cal. 979
- 28. Rogers Park Rifle Club, Chicago, Ill. 979
- 29. St. Paul Rifle & Pistol Club, St. Paul, Minn. 979
- 30. San Francisco Tel. Rifle Club, San Francisco, Cal. 979
- 31. Corvallis Rifle Club, Hamilton, Mont. 978
- 32. Chicago Rifle Club, Chicago, Ill. 974
- 33. Hawthorne Rifle Club, Chicago, Ill. 974

- 34. E. Orange Rifle Club, E. Orange, N. J. 974
- 35. Los Angeles Rifle & Revolver Club, Los Angeles, Cal. 974
- 36. Minneapolis Rifle Club, Minneapolis, Minn. 974
- 37. Commonwealth-Edison Rifle Club, Chicago Ill. 973
- 38. Reed Indoor Rifle Club, Springfield, Ohio. 973
- 39. Manesboro Rifle Club, Berlin, N. H. 972
- 40. Beaver Rifle Club, Beaver, Pa. 972
- 41. Arlington Rifle & Pistol Club, (2nd team) Arlington, N. J. 971
- 42. Robbins & Myers Rifle Club, Springfield, Ohio. 971
- 43. Joliet Rifle Club, 1st team, Joliet, Ill. 970
- 44. Peekskill Rifle Club, Peekskill, N. Y. 970
- 45. Huntington Rifle Club, Huntington, W. Va. 968
- 46. Concord Rifle Club, Concord, N. H. 966
- 47. Citizens Rifle & Revolver Club, Rochester, N. Y. 966
- 48. Jacksonville Rifle Club, (1st team), Jacksonville, Fla. 965
- 49. Business & Professional Men's Rifle Club, Boston, Mass. 965
- 50. Worcester Pistol & Rifle Club, Worcester, Mass. 965
- 51. Norwalk Rifle Club, Norwalk, Conn. 965
- 52. Towanda Rifle Club, Towanda, Pa. 964
- 53. University of Chicago Civilian Rifle Club, (2nd team), Chicago, Ill. 964
- 54. Fremont Rifle Club, Fremont, Ohio. 964
- 55. Covington Rifle Club, Covington, Va. 962
- 56. Providence Rifle Club, Providence, R. I. 962
- 57. Bucyrus Rifle Club, Bucyrus, Ohio. 961
- 58. Victory Rifle Club, Amsterdam, N. Y. 961
- 59. Des Moines Rifle & Revolver Club, Des Moines, Iowa. 960
- 60. Saginaw Rifle Club, Saginaw, Mich. 959
- 61. Ridgeville Rifle Club, Evanston, Ill. 959
- 62. Fort Wayne Rifle & Revolver Club, Ft. Wayne, Ind. 959
- 63. Roberts Island Rifle Club, Stockton, Cal. 958
- 64. Manchester Rifle Club, Manchester, N. H. 958
- 65. Claremont Rifle Club, Claremont, N.H. 958
- 66. Forest Service District No. 1 Rifle Club, Missoula, Mont. 957
- 67. Jacksonville Rifle Club, (2nd team) Jacksonville, Fla. 957
- 68. Marine Corps Civilian Rifle Club, Springfield, Mass. 956
- 69. Tacoma Rifle & Revolver Club, Tacoma, Wash. 956
- 70. Elmira Rifle & Revolver Club, Elmira, N. Y. 955
- 71. Lakewood Rifle Club, Lakewood, N. J. 955
- 72. Rumford Rifle Club, Mexico, Me. 955
- 73. Franklin Rifle Club, Franklin, Pa. 954
- 74. Grand Forks Rifle Club, Grand Forks, North Dakota. 954
- 75. Roundup Rifle & Pistol Club, Roundup, Mont. 953
- 76. Altoona Rifle Club, (1st team), Altoona, Pa. 953
- 77. Moraine National Rifle Club, Dayton, Ohio. 953
- 78. Detroit Rifle & Revolver Club, Detroit, Mich. 952
- 79. Scott Rifle Club, Scott, Arkansas. 951
- 80. Riverside Rifle Club, Riverside, Calif. 951
- 81. Lakewood Rifle Club, (2nd team), Lakewood, Ohio. 948
- 82. Wewoka Rifle Club, Wewoka, Okla. 948
- 83. Mound City Rifle Club, St. Louis, Mo. 947
- 84. Rochester Rifle Club, Rochester, N. Y. 946
- 85. Du Pont Rifle Club, Flint, Mich. 945
- 86. University of Chicago Civilian Rifle Club, (2nd team), Chicago, Ill. 944
- 87. Miami Rifle Club, Cincinnati, Ohio. 943
- 88. Chibridge Rifle Club, Greenville, Pa. 939
- 89. E. Saginaw Rifle Club, Saginaw, Mich. 939

- 90. Albion Rifle Club, Albion, Ind. 938
 - 91. Minneapolis Marine Rifle Club, Minneapolis, Minn. 937
 - 92. Joliet Rifle Club, (2nd team), Joliet, Ill. 936
 - 93. Lamar Rifle Club, (3rd team), Lamar, Colo. 931
 - 94. Altoona Rifle Club, (2nd team), Altoona, Pa. 929
 - 95. Chicago Engineers Rifle Club, Chicago, Ill. 929
 - 96. Lamar Rifle Club, (4th team), Lamar, Colo. 928
 - 97. Atlanta Rifle Club, Atlanta, Ga. 923
 - 98. Interwoven Rifle Club, New Brunswick, N. J. 921
 - 99. Niagara Falls Rifle Club, Niagara Falls, N. Y. 919
 - 100. Cazenovia Rifle Club, Cazenovia, N. Y. 918
 - 101. Paterson Rifle Club, Paterson, N. J. 917
 - 102. Hoosier Rifle Club, Indianapolis, Ind. 916
 - 103. Liberty Rifle Club, Dubuque, Iowa. 915
 - 104. Varnum Continentals Rifle Club, E. Greenwich, R. I. 914
 - 105. Needles Rifle & Revolver Club, Needles, Cal. 913
 - 106. Lamar Rifle Club, (1st team) Lamar, Colo. 911
 - 107. New Bedford Rifle Club, New Bedford, Mass. 910
 - 108. Yellowstone Rifle Club, (2nd team), Billings, Mont. 910
 - 109. Military Service Rifle Club, Elizabeth, N. J. 909
 - 110. Cromwell Rifle Club, Cromwell, Ind. 908
 - 111. Commencement Bay Rifle Club, Tacoma, Wash. 907
 - 112. Yellowstone Rifle Club, (1st team), Billings, Mont. 907
 - 113. John Forrester Rifle Club, Pittsburgh, Pa. 901
 - 114. Norwalk Rifle Club, (2nd team), Norwalk, Conn. 900
 - 115. Shawnee Rifle & Revolver Club, Lima, Ohio. 898
 - 116. 196 Company D. H. R. Rifle Club, No. Tonawando, N. Y. 894
 - 117. Lamar Rifle Club, (2nd team), Lamar, Colo. 892
 - 118. Danbury Rifle Club, Danbury, Conn. 891
 - 119. Nevada City Rifle Club, Nevada City, Cal. 882
 - 120. Onondaga Rifle Club, Syracuse, N. Y. 882
 - 121. Eclipse A. A. Rifle Club, Franklin, Pa. 877
 - 122. Camden Rifle Club, Camden, N. J. 874
 - 123. Berkeley Def. Corps Rifle Club, Berkeley, Calif. 869
 - 124. Groton Rifle Club, Groton, Mass. 837
 - 125. Watertown Rifle Club, Watertown, Mass. 822
 - 126. Co. G. Rifle Club of Springfield, Mass. 774
 - 127. Mt. Washington Lyceum Rifle Club, Pittsburgh, Pa. 568
- 19 clubs not reported.

ALWAYS HAVE DRY MATCHES

Marble's Water-proof Match Box keeps matches dry, holds enough for several days, absolutely waterproof. Made of seamless brass, size of 10 gauge shell.

55c at your dealers or sent by mail, post-paid. Write for catalog of Marble's Sixty Specialties for Sportsmen.

MARBLE ARMS & MFG. CO.
502 Delta Ave. Gladstone, Mich.

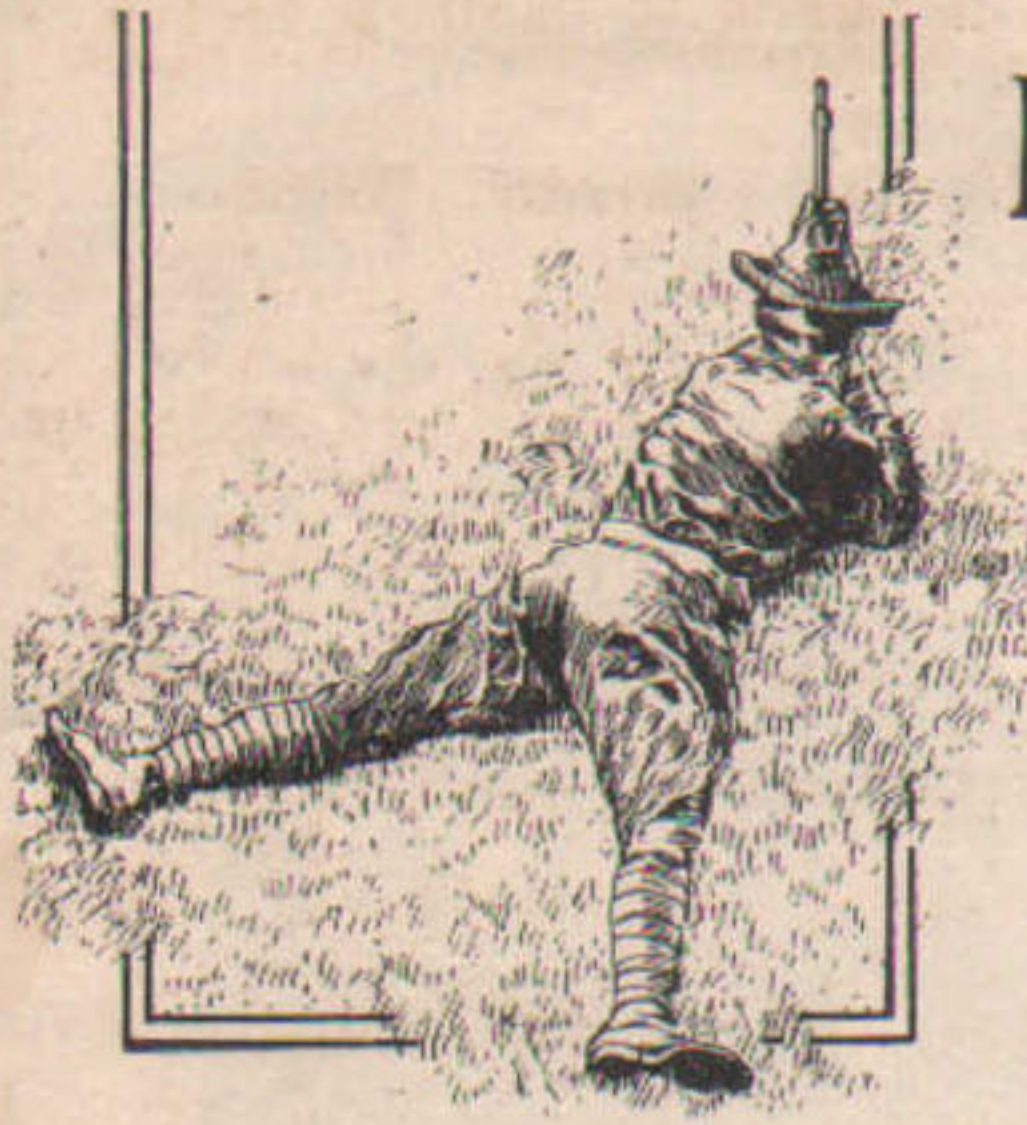


THE ENORMOUS DEMAND FOR

Hoppe's Nitro Powder Solvent, No. 9

has caused us to greatly increase manufacturing facilities, and we are now located at

2314 North Eighth Street, Philadelphia, Pa.
FRANK A. HOPPE, Manufacturer



Loads And Re-loads

In this column, conducted by Lt. Col. Townsena 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. This 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.

WE are able to secure considerable dope on cartridge components with the exception of primers. Would appreciate information as to where we can secure dope on primers. For instance—how are we to tell which are mercuric and which are non-mercuric?
F. D. E., Dayton, Ohio.

Answer: At the present time the only non-mercuric or non-fulminate primers on the market are the following:

Rem. U. M. C. Nonmercuric Primer No. 9.
United States Cartridge Co., Primer No. 8.
Frankford Arsenal Non-fulminate Primer No. F. A. 70.

We know that a number of companies are manufacturing other non-mercuric primers, but they have not yet placed them on the market, and we believe that they regard them as still in the experimental stage. There is much need for a small non-mercuric primer of the correct size for the pistol cartridges, and such rifle cartridges as the .25-20 and .32-20.

The primers listed above are all right for use with all modern high pressure smokeless powders. Sometimes the primer makes considerable difference in the performance of the powder, and this is the reason why certain primers and powders are not placed on the market. For example, many of the cartridge companies are now loading their cartridges of the .30-30 series with DuPont No. 25 powder, a powder which is not listed for sale by the DuPont Company. With non-fulminate primers this powder gives very even and low pressures, but if fulminate primers are used the pressure at once rises to a very dangerous degree.

IS there any truth in the report that some time in the near future that the Springfield rifle will be issued with a receiver sight and if so will it be issued to rifle clubs and members in time for next season's target practice.

For hunting I use a Newton .30 U.S.G. What effect will the take down and sight on end of firing pin have on the accuracy as compared with Springfield as issued?

J. D. T., Lead, S. D.

Answer: The Ordnance Department of the Army is now at work on the design of a receiver sight for the Springfield rifle. Several models are being developed, all of them being apertures situated near the bridge of the receiver. One of these is practically the Lyman No. 48 receiver sight. These models will be tested soon at the Infantry School, and it seems probable that one will be adopted, and that the Ordnance Department will be directed to manufacture all Springfield rifles in the future with this sight. At the very best, however, it will be at least a year before any rifles are manufactured for issue with this sight.

At present the best one can do is to get a rifle with the regular Model 1905 rear sight, and then if desired it can be sent to the Lyman Gun Sight Corporation, and a No. 48 Lyman receiver sight, or a No. 103 bolt sight can be fitted. The bolt sight is the best for hunting, but is not suitable for military shooting, particularly in the prone position, as it is too near the eye.

Members of the National Rifle Association can purchase one Springfield rifle for personal use. For information relative to this address The Director of Civilian Rifle Practice, Woodward Building, Washington, D. C.

The takedown feature on the Newton rifle, in my opinion, will have no detrimental effect on the accuracy provided the screws are kept screwed up very tight. A sight on the end of the cocking piece should be as accurate as the regularly issued sight on the Springfield, provided the action has not been altered or injured. The cocking piece seemingly has a little play in it, but you will notice that every time the slack or safety pull is taken up this cocking piece automatically comes to exactly the same place with reference to the receiver.

YOU used at one time a 180-gr. "mushroom" or "umbrella-point" bullet for special loading, Springfield 1906. I have been unable to find a bullet of this character and weight and am wondering if you can give me information as to same and as to possibility of using bullets made by "U.M.C." for Krag and Winchester.

G. R. N., Cleveland, Ohio.

Answer: The bullet referred to is the 180 grain "Umbrella" point bullet manufactured by the Rem.-U. M. C. Co., and regularly loaded in the .30-40 Krag cartridge. I have used this bullet with good results with 51.5 grain of DuPont I.M.R. No. 15 powder, giving a velocity of about 2650 feet per second. Some of these bullets which I got about a year ago did not seem to give the best accuracy, and I have temporarily gone back to the 172 grain Newton bullet, but only temporarily because I think that the 180 grain Umbrella bullet is the best game missile for this cartridge. Probably the trouble with my bullets was that they were "war made". I think that you will find that they are all right now.

WILL you kindly advise me if a rifle chambered for the .03 Springfield cartridge can be used for the .06 cartridge, and if it can be used would you recommend the use of the .06 cartridge in a rifle chambered for the .03 cartridge? Is there any reason why an .03 case cannot be loaded with the same powder and powder charge and the same bullet as is used in the .06, thus getting the same ballistics as in the .06 or will this charge give a higher pressure which would not be safe for use in a rifle chambered for the .03?

A. L. S., Niagara Falls, Ky.

Answer: The .03 cartridge has a shell which is the same as the .06 cartridge, except that it is about 1-20th inch longer at the neck. If your rifle is chambered for the .03 cartridge you can shoot a .06 cartridge in it, but as it is chambered for a shell longer at the neck the bullet will jump through this long neck, you will get poor accuracy, and the gas cutting will quickly ruin your chamber and rifle.

The .03 cartridge can be reloaded exactly the same as the .06 cartridge, with the same bullets, but the entire cartridge will be longer than the standard, and as a consequence you will not be able to work the cartridge through the magazine.

Also your chamber is throated for the 220 grain blunt point bullet, and you will not get quite as good accuracy with this rifle with a pointed bullet as though it were used in a barrel properly throated for it.

You should use only .30 calibre Model 1903 shells in this rifle, and I would advise that you also use the 220 grain bullet made for this cartridge by the Winchester Repeating Arms Company. This company can sell you this ammunition ready loaded, or the component parts of it.

You can get full information relative to the loads for this cartridge by writing to the Rifle Smokeless Division, E. I. duPont de Nemours, & Co., Wilmington, Delaware, or you will find them all in my book, "The American Rifle" which I think you can find in any library. Powder charges the same as for the .06 cartridge.

I HAVE recently joined a rifle club which shoots at 200 yds. off hand, and I am in need of a rifle for this work.

One trial of my .22 Musket, on a windy day, soon convinced me that I would be greatly handicapped compared with the other members, who use a variety of heavier arms, from .25 to .45 calibre, but always with the bullet loaded ahead of the shell.

No doubt the obvious course would be to secure a gun of the 32-40 type, but I want an arm for occasional highpower ammunition and for accurate reduced loads of fixed ammunition, for small game shooting, such as the .30 calibre jacketed bullets with No. 80 powder will provide.

I am able to obtain a 30-40 Winchester S.S. and I wondered if this gun could be used for this work, loading Schuetzen style. The powder would, I suppose, be the principal difficulty. How about No. 80 in about the same charge recommended for use in the above mentioned load? In fact I would use that load if it were not for the expense of the jacketed bullet and the added difficulty of loading the bullet in the shell over that involved in placing a lead bullet direct in the rifling.

While on the subject; could a similar course be followed with the Springfield, or would the breech mechanism interfere with the use of the bullet seater?

S. C. S., Springfield, Ohio.

Answer: I should advise that you should by all means obtain the 30-40 Winchester single shot if the rifle is in good condition. I think that you will get much better results from it than you will from any factory rifle now obtainable. After obtaining if you should equip it with a Lyman No. 103 rear sight with cup disc, or else with a Winchester Type A, 5 power telescope with No. 2 rear mount. This telescope is no longer made and you would have to get one second hand by advertising for it.

Do not attempt to seat your bullets ahead of the shell. In very few cases does this increase the accuracy at all because unless everything is exactly right the rifle seldom succeeds in getting his bullet into the rifling ahead of the shell without deforming the bullet more than shooting it out of the shell would have done. It will not work at all with the modern power rifle.

On the other hand you have a great advantage in using the high power rifle, in that you use jacketed bullets, and these invariably give more accuracy than lead alloy bullets, except only when the lead alloy bullet is shot from a Pope muzzle loading rifle. The rifling and the jump from the chamber, do not deform the jacketed bullet as they do the lead alloy bullet.

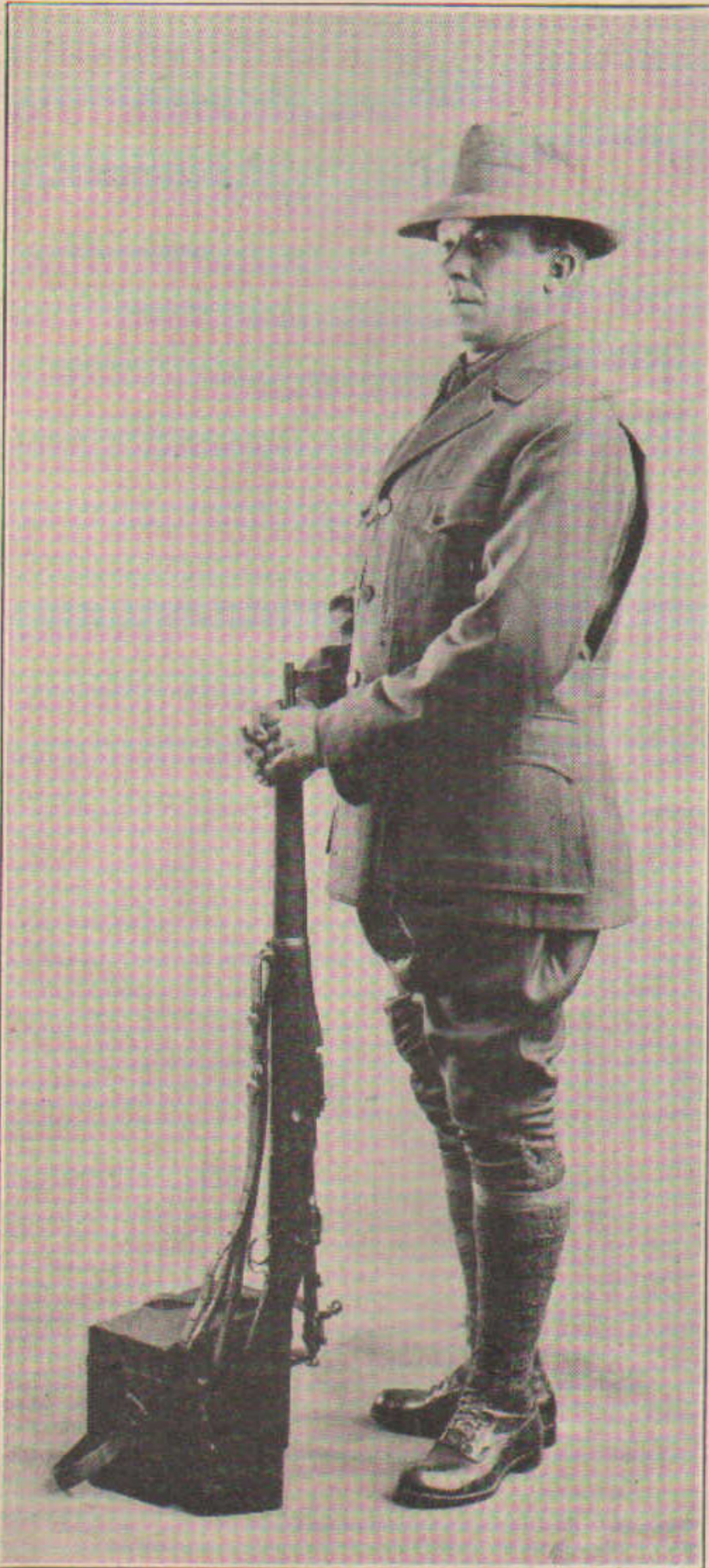
I think that from the 30-40 you will get the very best results from the regular reduced load of 150 grain pointed, full jacketed bullet, 18.5 grains of DuPont No. 80 powder, and non-mercurial primer. I think that you will get a little better results from shells that have already been fired in your rifle, and then resized at the neck only to hold the bullet friction tight without crimp. Load the bullet just a little further out of the shell than the crimping cannellure, so that the bullet will be well up in the throat of the chamber before it is fired. The velocity will be about 1,500 feet per second at the muzzle, and

this load will require about one half the allowance for wind that is required for the .30-40 schuetzen load.

My own experience is that this load in Winchester single shot, repeating, Krag, and Springfield rifles, is very much more accurate than breech loading .32-40 rifles with any load, except perhaps the Hudson load in a throated barrel.

Should you wish more speed, less wind allowance, and greater range, you can go to a 180 grain jacketed, pointed, bullet, and 36 grains of Du Pont No. 20 powder which you will find will give splendid accuracy in almost all .30-40 rifles.

The various .30 calibre jacketed bullets are very expensive these days unless you purchase them from the Government, in which case they are cheaper than any other factory made bullets.



N. R. A. UNIFORMS

Style: SENIORS	
N. R. A. No.	600 Coat\$5.00
"	601 Breeches 4.00
"	602 Spiral puttees .. 3.00
"	603 Canvas leggings 1.25
"	604 Olive drabshirt.. 4.75
"	605 Hat 2.50
"	606 Web belt50
Style: JUNIORS	
N. R. A. No.	650 Coat\$4.00
"	651 Breeches 3.50
"	652 Spiral puttees .. 2.75
"	653 Canvas leggings 1.25
"	654 Olive Drab shirt 3.25
"	655 Hat 2.25
"	656 Web belt50

The Sigmund Eisner Co.

Salesrooms Factory
105 Fifth Ave., N. Y. C. Red Bank, N. J.

To purchase them you only have to become an annual member of the National Rifle Association, which costs only two dollars. Then write to The Director of Civilian Marksmanship, stating that you are a member of the National Rifle Association, and asking him to send you a price list of rifles, ammunition, and components of ammunition, together with instructions about remitting. You will find that you will save your membership dues on the first lot of primers and bullets that you purchase.

Please understand that it is possible to seat a bullet ahead of the shell in both Winchester single shot and Springfield rifles, but you will have to use a very reduced powder charge to avoid ringing the barrel, and you will get very much better accuracy with the regular jacketed bullet seated in the regular manner. If you have a good Springfield rifle it is not at all advisable to get a Winchester single shot as the Springfield will shoot better than the single shot. In fact the Springfield will do better work than any rifles made today except the fine hand made Pope and Neidner rifles. It has taken me many years of experimenting to find this out, and it is very hard to make riflemen believe it, but it is so, nevertheless.

I AM anxious to develop a good load for a rifle of the Ballard Schuetzen pattern having a 30-inch octagon barrel and double set trigger. Weight about 13 lbs., Cal. about .413 to bottom of grooves. Shell 2 3/8 inches in length, straight. I say shell. Have never been able to get a shell that was a perfect fit but a 40-70 Ballard cut off to 2 3/8 inches in length fits the chamber perfectly. With following:

The rifle was evidently chambered for a very thick cartridge case as an ordinary shell expands so much upon firing that a bullet which fits the bore of the gun perfectly will drop loosely into the shell.

By using 40-70 Ballard shells cut off as mentioned and seating a 330 grain bullet well into the rifling have been able to get fairly good results but not nearly as good as the rifle should be capable of. It is in excellent condition inside and out and shoots so sweetly that I am anxious to get the right fodder for it. Could you tell me just what ammunition is correct for it and where I might be able to get it.

O. R., Seaside, Ore.

Answer: The specifications of your barrel most nearly fit the .40-70 Bullard cartridge. This is a straight taper cartridge, shell 2 3/8 inches in length, I think that the shell has a larger head than the .40-70 Ballard shell. The factory bullet is grooved and weighs 232 grains. The diameter of the bullet is .413-inch. This cartridge was made regularly for the Bullard Repeating Rifle, but it is just possible that the former owner of your rifle has a barrel for this cartridge fitted to a Ballard action.

.40-70 Bullard cartridges can be obtained from the Winchester Repeating Arms Company, New Haven, Conn. The Ideal Manufacturing Company, New Haven, Conn., used to make reloading tools for it, and listed bullet No. 413174 for this cartridge. If you care to reload ammunition for this rifle, and the .40-70 Bullard proves to be the correct cartridge for it, as I think it is, I would advise that you use the Ideal bullet or a factory bullet, cast about 1 part of tin to 20 parts of lead, and that you seat the bullet in the shell with considerably more of it protruding from the mouth of the shell than in the factory cartridge.

Please understand that this is just a guess about the .40-70 Bullard cartridge, but it is the only cartridge made in America which comes anywhere near your description of your bore. It will not be possible to tell absolutely without trying the ammunition or making a sulphur cast of the chamber.

THE AMERICAN RIFLE

By Lt.-Col. Townsend Whelen

* *

Only book of its kind and scope in English. By the supreme American authority. Gives every scrap of available information on its subject. A mine of values for rifle lovers. Over 600 pages. Over 300 illustrations. Price \$5.00. Order from

* *

Arms and The Man

Woodward Building Washington, D. C.

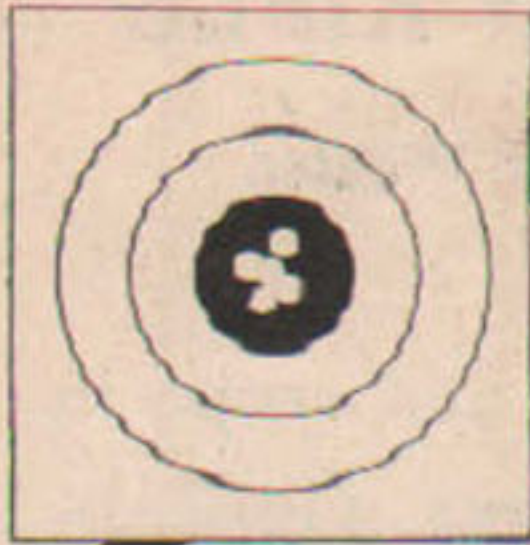
Smokeless Powder

(Continued from page 10)

of powder are tested until the standard velocity is obtained. For instance when a new lot of powder for the .30-1906 cartridge comes in off the line it might test out on the first test with a velocity of 2650 F. S. The operator would immediately load up ten more cartridges with .1 to .2 grains less powder and test those. These might give 2635 F. S. If this happened he would estimate the required charge from the proceeding one, load up a lot of cartridges and test them. As soon as he found the required charge to give 2640 F. S. with the various corrections for temperature, barometer and rifle added and subtracted this would be known as the standard charge for that lot of powder under test provided that the pressures tested out correctly and also that the powder charge was not too bulky or not bulky enough to fill the required space in the cartridge in which it was to be used.

The pressure gun is a rifle which has a hole drilled into the bore a short distance from the breech, in other words, into the chamber two-thirds of the length of the cartridge from its head. A perfectly fitting plunger is fitted into this hole and is held in place by a copper crusher which in turn is held in place by a screw. Each plunger is sealed against gas escape by a gas check that is fitted onto its base in the same manner that a gas check is fitted on the base of a gas check bullet.

A cartridge is now inserted in the rifle chamber, the muzzle of the rifle stuck into a hole in the wall and a shot is fired into the butt. The copper cylinder is taken out and measured and its resulting length when compared with a table prepared for that set of crushers gives the pressure in pounds per square inch in the chamber of that rifle. A series of ten or more shots are fired to



THAT'S Bunching Them

Only with a thoroughly clean barrel can you put the shots where you want them—the cleanliness that is assured by using.

Pyramid Solvent

Dissolves residue of high power smokeless and black powders easily, quickly. Loosens metal fouling. Reduces use of brass brush. Contains no destructive chemical and no moisture. After using Pyramid Solvent, use 3-in-One Oil to prevent rust and to lubricate. Pyramid Solvent is for sale by most firearms dealers, 3 ounces in a convenient flat can that fits pocket or shooting kit, 30c per can. If your dealer can't supply you, send 30c and we will send you a can postpaid.

THREE-IN-ONE OIL CO. 165 AKP Bdwy., New York

C 218A



RIFLE CLUB MEMBERSHIP CARDS



The cards are sold to rifle clubs at the low price of \$1.00 the hundred.

ARMS AND THE MAN
WASHINGTON, D. C.

secure an average as each shot will vary slightly from the ones preceding and following it.

The Automatic pistols and revolvers are tested by holding them in the hand and resting the muzzle on the front rest of the machine rests and noise from .44 and .45 caliber revolvers is quite noticeable on this indoor range and rapid fire shooting from a .45 Colt soon arouses the ire of the whole force in the Ballistic Station.

The Kenvil Plant has outdoor ranges for testing cannon powder in the 75 M.M. field guns and 155 M.M. Howitzers. Large backstops are provided to keep the heavy projectiles from bouncing off into the next county and killing some of the innocent natives of Jersey. It is quite interesting to watch the firing of these guns especially the 6 inch Howitzer. When this is fired with a low velocity charge over the 1,000 yard range, the projectile can be seen driving through the air until it strikes in the butt and sends sand and dirt flying in the air.

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.

OLD-TIME and modern firearms bought, sold and exchanged. Kentucky flint-lock rifles, old-time pistols, revolvers, guns, swords, powder horns, etc. Lists free. Stephen Van Rensselaer, 805 Madison Avenue, New York City.

Black Diamond Gun Grease
Keeps your guns looking and shooting like new, 50 cents, postpaid. Send for testimonial letters and circulars.

CHURCHILL & SCHEIFER
223 E. North Street : : Buffalo, N. Y.

FOR SALE—One .38 Colt O. M., 6" barrel, brand new, in original package \$47.

One .32 Colt New Police 6" barrel, plain sights, perfect inside, outside holster worn. Ideal No. 4 reloading tool, black holster and 230 cartridges, \$20.00. Certified check or money order. A. B. Coulters, 1103 Cranston Street, Arlington, R. I.

FOR SALE—One Pacific Ballard, .40 or .45 cal., 30" full oct. bbl., wood same grain as stock; now .22 long rifle job of relining by Driller, barrel 27 1/2", Sharps original tang sight cut down to shorten length, original sight base on heel of stock, most excellent for prone shooting.

One Sharps-Borchardt hammerless, plain action and stock, barrel a special .38 cal. Remington with beautiful fore-end checkered, no sight slot for rear sight, no sights, barrel has breech ornaments like old Rigby barrels; will sell action alone or with barrel.

One Remington single shot 38—50, L. N. Walkers modification of the Heppburn model, under lever, single trigger, fine Circassian stock with pistol grip and fore-end checkered, vernier rear and wind-gauge front sights, with special discs to fit rear and front sights making a tubeless magnifying sight for target work, in fine condition. These Walker modifications few and rare.

One Ballard Pope Schuetzen, 32" round Pope barrel with special built fore-end with cork faced finger rest, to be used instead of palm rest, double set triggers, Pacific lever with lock filled with walnut, fine high-combed stock for use with scope, scope blocks on barrel, no slots nor sights, stock of fine walnut and Schuetzen buttplate; formerly owned by W. A. Tewes. Other Ballards with set triggers for sale. Also scopes. Dr. Geo. R. Hays, Richmond, Ind.

FOR SALE—New star gauged 1919 National Match model Springfield .03 rifle. Kerr sling strap, extra firing mechanism and oiler and thong case. Price \$30.00. Joe Rich, 19 Hilton St., Bradford, Pa.

FOR SALE—Winchester model 1895, .30, 1906, 24-inch, fine condition, \$30. Remington trap gun, 30 inch, excellent condition, \$50. Swiss .41 repeater, good serviceable condition, with a few cartridges, \$4.00. Several bullet molds, \$1.25 each. Mills belt for Remington clips, never used, \$1.25. Web pocket and two magazines, 45 Colt., \$1.50. Dr. Lincoln Riley, Wisner, Nebraska.

FOR SALE—New U. S. Rifle, calibre .30, Model 1917; price, \$30. Edward M. Boggs, Box 549, Okland, Calif.

WANTED—Ballard set trigger, engraved action, or Winchester set trigger action. No objection to complete rifles if small calibre. Also want Watson Rifle sights. Curtis Liston, Johnstown, Pa. P. O. Box 712.

WANTED—Krag's, Springfields and B. S. A. Rifles Mousers, Lugers, Smith & Wesson and Colt revolvers; also short guns any make. G. Henri Mathewson, Jackson, Ga.

WANTED—3240 Pope bullet mould in good condition. Chas. Miller 3034 Seymour Ave., Cleveland, Ohio.

WANTED—One or two .30 calibre Springfield rifles with wornout barrels. Must be reasonable. C. S. Landis, 623 Geddes St., Union Park Gardens, Wilmington, Del.

WANTED—8 gauge hammer shotgun. Justice S. Jones, Gastonia, N. C.

WANTED—Sharps, Maynard or Ballard rifles in fine condition. Also Stevens Diamond Pistol. G. L. Lehle, 3739 Pine Grove Ave., Chicago, Ill.

WANTED—Farrow or Wurrfein, any calibre or condition. Dr. Geo. R. Hays, Richmond, Ind.

WANTED—A 5 A. Winchester scope with No. 2 mountings. Chas. H. Johnson, 65 N. Hirst St., Philadelphia, Pa.

WANTED—.38 S-W Special mold and tool, also one Ideal mold No. 308329 in A-1 condition. C. C. Snavely, Hopkins, Minn.

FOR SALE—Remington target pistol, .22 cal., 8-inch barrel. First class condition inside and outside. \$25.00 W. L. Darling, Custom House, Boston, Mass.

FOR SALE—.401 cal. automatic Winchester, with 200 ctg., good condition, \$25.00. 500 .45 cal. Colt automatic ctg., \$10.00. Justice S. Jones Gastonia, N. C.

FOR SALE—.30 Newton barrel and bolt; will fit in any Newton action; famous segmental bore, extremely accurate and practically new condition with 7 boxes .30 Newton cartridges loaded with soft point copper jacket bullets; about 50 empty shells; \$40.00 for the lot. H. E. Beebe, 1233 Main Street, Buffalo, N. Y.

FOR SALE OR EXCHANGE—Two very fine Ballards Schuetzen rifles. Pacific double trigger action, Circassian cheek piece stock, palm rest, 30" No. 5 oct. barrel capped for scope. Uses Dr. Hudson .38 smokeless load. Barrel bored by Schoyen & Peterson. One Union Hill action double trigger, just been hand engraved. Schuetzen stock, cheek piece very fine curly walnut. Checked schuetzen butt. Has Pope 3240 perfect as new barrel No. 5, muzzle loader or breech loader, best mold, greaser, false muzzle, starter, and loading rod, also bullet seater breech. .38 cal. cost about \$100 with tools, without any telescope. 3240 made 1 1/4" group in Pope machine rest, 200 yards. Would exchange either rifle for lighter arms of good quality. Harvey Lovell, care of Savoy Hotel, Rochester, N. Y.

FOR SALE—Krag Rifle, in perfect condition, with new Kerr sling and 250 rounds of ammunition. Price (packed) \$10. Will trade for Ballard Action in perfect condition. A. M. Morgan, 623 Lamont St. N. W., Washington, D. C.

FOR SALE—Model 1903 Star-Gauged Springfield, pistol grip, sporting stock, government rear sight, tapped and stock grooved for Lyman No. 48, barrel perfect inside; last score 47 at 1,000 yards; beautiful gun; first check \$35.00. Also Newton .256, pistol-grip, peep sight on bolt, tapped and stock grooved for Lyman No. 48 sight; loading tools; about 150 shells; some bullets; in perfect condition out and in; worth \$80.00; sell for \$40.00.

WANTED—Winchester 5-A Scope and .22 L. R. barrel, by Pope or Neidner, or any make of match quality that I can use in Winchester musket action. Also want good 25-power Telescope. W. S. Belding, 759 Union St., Bangor, Maine.

FOR SALE—Luminous Sights for Colt .45 Automatic Pistol; snap on and off instantly. The best known rifleman in America, an Army officer of high standing, writes: "I regard them as life insurance which no line officer can afford to be without. Several times in my twenty years' service I would have given a million dollars, if I had it, for a set like these." Sent prepaid on approval for \$3.50, with money back guarantee if dissatisfied. E. F. Watson, 100 Broadway, New York, N. Y.

FOR SALE—Antique firearms, swords, powder horns, flasks, battle flags, medals, prints. Catalogue free. Nagy, 33 S. Eighteenth Street, Philadelphia, Pa.



WINCHESTER

SPORTSMEN'S HEADQUARTERS

AN Institution of Service—conceived and created for the further assistance and convenience in New York City of men and women from everywhere who are accustomed to find in the Winchester organization the answer to every shooting problem.

At Winchester Sportsmen's Headquarters you will find a sportsmen's welcome as cheery as the glow of the camp-fire at the end of the day's hunt. And information on all matters pertaining to sport—whether the query concerns a hunting trip, the

National rifle matches at Camp Perry, a fishing trip, or just a day at the beach.

At your command are *sportsmen*—men internationally known in the world of sport: Mr. Thomas A. Davis, Manager, has circled the globe in Winchester service. Mr. J. H. Cameron, Assistant Manager, has spent thirty years in the service of Winchester. Mr. R. E. Boyd for many years has been a leading authority on outdoor sport.

Come to Sportsmen's Headquarters when in New York, and obtain in leisure the full benefit of the experience of these Winchester experts. Make this your headquarters while here, and invite your friends. For your further convenience, you will find displayed a complete stock of Winchester products, including:

Winchester World Standard Guns and Ammunition
 Winchester Fishing Tackle
 Winchester "Barney & Berry" Ice and Roller Skates

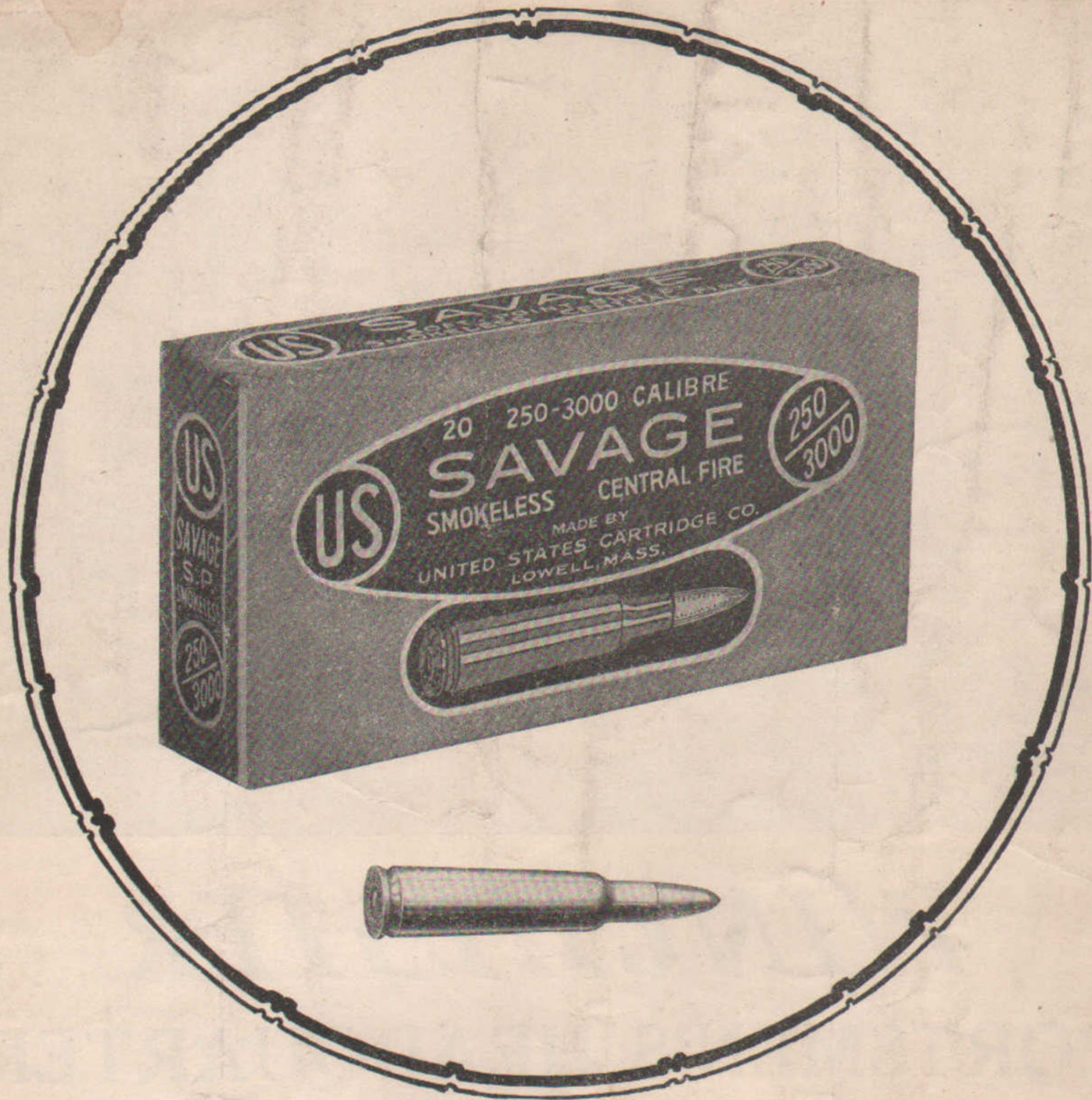
Winchester Pocket Knives, Razors, and other selected cutlery
 Winchester Carpenter's and Mechanic's Tools
 Winchester Flashlights and Batteries

WINCHESTER SPORTSMEN'S HEADQUARTERS

Centrally Located for Your Convenience

469 Fifth Avenue, corner 40th Street

New York City



250-3000 High-Power Savage Cartridges

You men who own a 250-3000 Savage High-Power Rifle will want to try U. S. Ammunition in it.

Ask your dealer for U. S. 250-3000 High-Power Savage Cartridges. These cartridges are made with smokeless powder and either in soft point or full metal jacketed bullet.

Packed in boxes of 20 with the standard orange and blue label.

Your dealer has them or he can get immediate shipment for you, by writing our nearest selling agent.

UNITED STATES CARTRIDGE COMPANY

111 BROADWAY, NEW YORK

General Selling Agents: National Lead Company, Boston, Buffalo, Cleveland, Chicago, St. Louis, Cincinnati; United Lead Company, New York, Philadelphia; National Lead and Oil Company, Pittsburgh; James Robertson Lead Co., Baltimore; American Smelters Securities Co., San Francisco; Hingston-Smith Arms Co., Winnipeg; John Hallam, Ltd., Toronto.