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# Belding & Mull

## HAND BOOK



**HANDLOADING  
AMMUNITION**

**Philipsburg • Pennsylvania**

(Copyright 1949)

*The*  
**BELDING & MULL**  
**HANDBOOK**



Containing Complete Instructions For  
HANDLOADING AND RELOADING OF  
AMMUNITION FOR REVOLVERS,  
PISTOLS, RIFLES, SHOTGUNS



A CATALOG OF B. & M. RELOADING  
TOOLS, RELOADER'S SUPPLIES



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**BELDING & MULL**

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## F O R E W O R D

*M*OST rifle and revolver shooters find the comparatively high cost of commercial ammunition definitely curtails the full enjoyment of their favorite sport. In this Handbook we have endeavored to explain in a thorough, yet comprehensive manner, how, by reloading, to obtain economically the finest ammunition available. The material has been compiled with great care, unduly technical phrases having been omitted so that the beginner may not be confused. We believe, however, that the advanced hand-loader will find in the pages following many helpful practical suggestions and we trust the tables and other technical data may supply information that will prove valuable. Questions on this subject may from time to time arise upon which the reloader will desire additional information. Should a problem develop, we hope you will write us and explain in detail your difficulty. Your inquiry will receive our immediate and careful attention and there is, of course, no charge or obligation for this service.

BELDING & MULL

Philipsburg, Pennsylvania

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## WHY RELOAD?

There are numerous reasons why the handloading and reloading of cartridges for center-fire rifles and revolvers is well worthwhile. Among these may be mentioned economy, improved accuracy, and the wide variety of available loads.

### Economy

The subject of economy is of prime interest to most shooters. Authorities state that, to become thoroughly familiar with an arm, you should fire hundreds of rounds yearly—many say at least one thousand—and ammunition for the larger calibers costs from seven to eighteen cents per round. It matters little what the number may be for it would vary with the individual. The pertinent fact is that few possess the means to do a fraction of the shooting they really would like to do. For those then who desire to enjoy more shooting with the most accurate ammunition at the minimum cost, we recommend reloading.

Upon firing a loaded cartridge, there remains the empty cartridge case practically as good as new and representing often more than half of the cost of the original cartridge. Primers, Powder and Bullets are easily replaced in the fired cases with a set of good Reloading Tools. The cost of these components, even for the duplication of high powered factory loads, is surprisingly low and represents but a fraction of the price of the factory product. Reduced loads, obtainable only by handloading, are recommended by all authorities for their exceptional accuracy. They are admirably suited for all small game and short range target shooting and may be had at a cost approximating that of rim-fire ammunition of the .22 caliber class.

A reduced load uses but a small charge of powder and usually a cast bullet. These bullets may be purchased or made quickly and easily by the reloader. High power loads with jacketed bullets tend to destroy rapidly the accuracy of a fine barrel, but the reloader, using reduced loads will probably never have to replace his barrel, for with proper care it will last almost indefinitely.

Below you will find a table which shows fairly the approximate cost of factory and handloaded ammunition for several calibers. Line No. 1 is the price of one hundred rounds of standard factory ammunition. Line No. 2 is the cost of duplicating the factory product by reloading the fired case. In line No. 3 is found the cost of reduced loads when the bullets are cast by the reloader.

CALIBER	30-06	257 Roberts	250 Savage	220 Swift	38 Special	45 Colt
List price factory load, per 100 . . . . .	\$15.79	\$14.58	\$13.36	\$12.76	\$9.56	\$7.53
Reloaded using fired cases to duplicate factory loads . . . . .	6.55	5.33	5.28	4.82	3.31	3.87
Reloaded with reduced charge and home prepared bullets . . . . .	2.49	1.81	1.76	1.67	1.89	2.66

The above costs will vary due to market and transportation charges but they fairly show the truly great saving effected by reloading your ammunition.

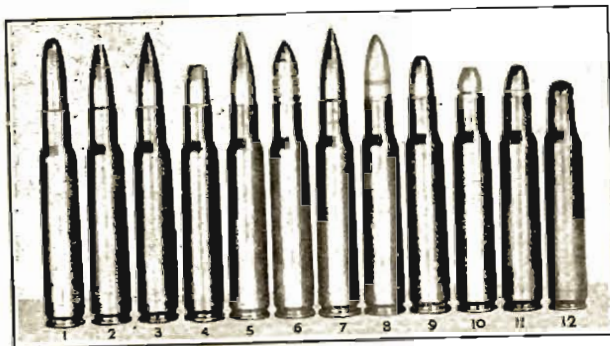


## Improved Accuracy

Ammunition secured by reloading is more accurate than the average cartridge for various reasons. Factory loaded cartridges must be loaded to a certain definite standard. They must function properly in any arm chambered for them and arms are of many makes and models. The brass cartridge case must be small enough to enter freely the smallest chamber likely to be found. They must also be short enough to allow their use in any action designed to receive them and, finally, they must be loaded so as not to develop pressures which may prove dangerous in old arms no longer manufactured but still in use.

Handloaded cartridges adapted to your individual rifle or handgun will be found more accurate than the average run of ammunition because they were reloaded for your firearm and are not makeshifts for any gun that happens to be of the same caliber. Cartridge cases once fired with full power loads expand to fit exactly the chamber of the arm in which they were fired. A bullet carefully seated in an expanded case will be centered when placed in the chamber. This

## Variety of Loads



SPRINGFIELD 30 CALIBER 1906

1. 220-gr. S. P. full power moose and grizzly bear load.
2. 180-gr. O. P. full power big game load.
3. 173-gr. Bt. F. J. service load.
4. 170-gr. S. P. 30-30 deer and black bear load.
5. 150-gr. F. J. service load.
6. 175-gr. solid bullet, excellent short range game load.
7. 145-gr. excellent deer load.
8. 169-gr. solid gas-check Squibb bullet, accurate short and medium range target load.
9. 110-gr. O. P., high speed vermin load.
10. 115-gr. solid bullet, excellent short range small game load.
11. 80-gr. O. P. 32-20, high speed vermin load.
12. 60-gr. round ball, cheap short range load.

perfect centering tends to increase the accuracy. The over-all length of the cartridge is important. For best accuracy the forward section of the bullet, when the cartridge is chambered, should nearly touch the rifling. Factory ammunition is of a standard length but the reloader may vary the depth of seating the bullet in the cartridge case to fit perfectly his particular arm. Superior results are bound to accrue.

It is interesting but true that, when factory ammunition only is fired, the greatest accuracy of a particular arm is usually unknown to its user. The reason is that supposedly identical arms are in reality not identical and the bullet and powder charge which proves best in one will not be the most accurate in the other. The handloader has at his control a choice of bullets, powder and powder charges and primers, and by experimenting along lines suggested further on in

this Handbook can develop cartridges which will be the most accurate for his arm. These facts indicate that improvement is possible in the matter of assembling ammunition for your particular rifle or handgun. You can obtain this superior ammunition by reloading.

Every real shooter is proud of a fine arm but the pleasure derived from it depends largely upon use. If the shooter does not reload he has available only such ammunition as is furnished by cartridge companies. This loaded ammunition, especially for the larger calibers, was designed primarily for big game shooting. It is too powerful for use in settled communities and if used on small game will blow it to pieces. The recoil from it is excessive and a good barrel will be worn out after firing from five hundred to five thousand rounds. The hand-loader can produce for his high powered arm, ammunition especially adapted for each of his many shooting requirements. High power loads duplicating the factory product, extremely accurate long range target loads using full jacketed target bullets and progressive burning powders, highly accurate target and game loads for ranges up to six hundred yards using lead bullets fitted with gas checks and a medium charge of "Bulk" Smokeless powder, and super accurate target and small game loads using a light charge of similar powders are all easily and uniformly assembled with a set of good reloading tools. From the foregoing it may readily be seen that the reloader has available a variety of highly desirable loads, the use of which greatly increases the service, interest and pleasure that can be derived from his favorite arm. Reloading so adds to the capabilities of the high powered rifle that its owner has in fact that truly all purpose arm about which so much has been written.

## Every Shooter Should Reload

From the foregoing it might seem that handloading is a technical and tedious process. Happily, however, such is not the case. The excellent design of B. & M. reloading equipment, the operation of which is fully explained in the following text, makes reloading a simple and surprisingly rapid practice. Anyone, whether he has knowledge of reloading or not, can, by following instructions and suggestions contained in this Handbook quickly and easily assemble standard full power loads, any of the highly desirable reduced loads, or special loads for his arms with the assurance that his reloaded ammunition will be equal in every respect to that which he has bought and in most instances he will find it superior.

The ease and accuracy with which an abundant supply of excellent ammunition can be assembled delight the beginner. As knowledge of the practice increases, interest in the components and analysis of the results obtained point the way to study of the science of ballistics. The composition and characteristics of the materials used, how a bullet acts and why it does so are subjects of major interest capable of limitless expansion. The experienced handloader will freely admit that loading his own ammunition is more than half the fun of shooting. It is a fascinating and instructive hobby that appeals to every real shooter.

Reloading equipment is a practical investment. An individual who does a reasonable amount of shooting will save on his ammunition bill in one season alone a sum sufficient to offset the cost of his reloading equipment. Frequently several individuals will find it convenient to purchase a set of tools for the group, thus distributing the initial cost so that it will be no higher than the price of a few boxes of loaded cartridges. Hundreds of Rifle, Pistol and Police Clubs have purchased one set of tools for the Organization and used them to reload many different calibers. Parts for B. & M. tools may be had in practically all calibers and used with one tool, thus it is entirely practical and economical for a group to purchase B. & M. equipment with additional parts for reloading the several desired calibers. If you will advise us as to the calibers you desire to reload we



shall be pleased to furnish a list of the parts required for multi-caliber reloading and quotations on such outfits.

On page 10 is a list of the tools required for reloading various types of ammunition and further on will be found a description of each tool, the service it performs and complete directions for its operation. A careful reading of these pages will thoroughly instruct you on how to reload. Assuming that you now understand the mechanics of handloading there will arise some question as to what to reload. "What primer, powder and charge, and what bullet shall I use?" will be problems requiring suggestions and recommendations for their solution. The primer question is easily settled. You should use a non-mercuric type of the proper size. On page 61 you will find a table listing the proper size of primers for the most popular rifle and revolver cartridges. If the caliber for which you desire to reload is not listed, advise us and we will recommend the correct primer. The question of what powder and powder charge and the proper bullet, is not, however, so easily settled since these depend largely upon the type of shooting you intend to do.

Beginning on page 25 is a general article on the characteristics and use of powders. From it you will learn the proper powder to use for your specific type of shooting. The quantity depends upon the type of load desired and the bullet selected and this leads us to the question of bullets which is perhaps the most fascinating phase of handloading.

There are many different kinds, sizes, shapes and weights of bullets but the reloader should not let the variety confuse him. On page 37 is a discussion of the characteristics and uses of the various designs of jacketed and lead bullets. A careful reading of this article should not only acquaint you with the subject of bullets but will suggest a type suited to your needs. If you select a jacketed bullet it is a simple matter to order one of the proper caliber, weight and design from the table on page 61. If your choice is a solid bullet you should look over carefully the "Cast Bullet" section of this Handbook which lists and thoroughly describes a large number of lead bullets. Each of these bullet designs was developed by an expert and is recommended unqualifiedly. Having now selected a primer, powder and bullet you will desire to know how much of the chosen powder should be used behind a bullet of the weight selected. This information is easily obtained because there is included in this Handbook a table of loads with bullets of various makes and recommended powder charges.

There are available today many excellent books on arms and ammunition which provide a large and complete source of information which you, as a reloader, as you progress in the development of super-accurate ammunition for your arm, will find valuable. See pages 78 and 79 for latest volumes available.

Reloading is not only the practical and economical way to obtain the most accurate cartridge for and the greatest service from an arm but it will so increase your interest and enjoyment in shooting that you will agree with thousands of others "that shooting is the King of all Sports".

Belding and Mull maintain a technical department which is ever ready to discuss, without obligation, any problem on handloading which may arise. We hope our customers will feel free to use this service. It matters not how trivial or important the subject may seem, we are always glad to co-operate and in so doing there is available to you experienced counsel on firearms and ammunition. We carry a complete stock of Primers, Primed Cases, Jacketed Bullets, Powders, and all the items a reloader needs and provide unexcelled delivery service. This feature makes it possible for the shooter to secure all his supplies which are manufactured by any of the American cartridge or powder manufacturers from this one source, thus effecting an important saving in shipping charges.

## Belding & Mull Straightline Reloading Equipment

Belding and Mull Reloading Tools are designed and manufactured to meet the demand of the modern shooter for superior reloading equipment. Old style tools of the pincher type apply the forces used in reloading at an angle to the axis of the cartridge case. This off-center application of force tends to squeeze the cartridge case to one side and greatly reduces the accuracy of the assembled ammunition. B. & M. engineers realized this disadvantage and developed their first Straight-line Reloading Tool, the predecessor of the highly refined B. & M. Model 26 and Model 28 Improved Tools. In these tools all forces are applied in an absolutely straight line—true to the axis of the case. There is no tendency for the case to cant or wobble. Case necks are resized and the bullet seated with the utmost precision and accuracy.



Each B. & M. Tool, must before shipment, successfully pass a final rigid inspection.

Along with this major improvement in handloading tools there are incorporated many additional refinements. The priming punch has a face concaved to seat primers without marking them and its travel is regulated with mechanical precision to press the primer home to the bottom of the case pocket. The force required to resize case necks properly is obtained by a stout handle and ample leverage. The B. & M. tool has several times the power of older tools and with it neck resizing is easily and quickly accomplished.

The method of holding the case has likewise been improved. Whether rim or rimless, they are held in the sliding cradle (part No. 3) by half their entire circumference. This half circumference hold is ample for the work. Cases can neither slip nor receive cut or distorted rims. In resizing case necks and bullet seating it is important that the tool provide a solid support for the case head with a wall absolutely square to the case axis. This is accomplished by the proper design and careful machining of B. & M. sliding cradles. All parts are ruggedly constructed of the materials best suited for the work required of them. Neck dies and expanding plugs are made of tool steel and hardened so that their accuracy is retained nearly indefinitely. To meet the rigid inspection requirements the machining must be accurate within extremely fine tolerances and the parts assembled with the utmost care. We might continue at great length enumerating the many smaller improvements in design and refinements in the construction of these precision tools which tend to increase the ease with which ammunition is assembled and guarantee its accuracy and uniformity. Let it suffice that the tools are properly designed and of such mechanical excellence that they receive the highest praise of all experienced handloaders.



Our policy is to make reloading equipment that is so perfect in design, so sound in purpose, and so indispensable in use as to be well above competition.

## What B. & M. Tools are Needed to Reload Center-Fire Cartridges

Handloaders may be roughly divided into two classes, those who purchase their bullets ready to load and others who prefer to cast a large share of their supply.

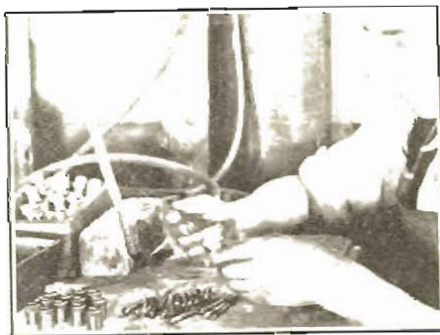
Having bullets available the following list of B. & M. Reloading Tools includes all that is required to assemble cartridges for use in any single shot or bolt action arm.

- 1—B. & M. Model 28 Improved Reloading Tool.
- 1—B. & M. Visible Powder Measure.
- 1—B. & M. Loading Funnel.
- 1—Pair Loading Blocks.

**Material**—Empty cartridge cases, primers, powder, and jacketed or cast bullets, the latter sized and lubricated.

To reload for any center-fire rifle which requires the crimping of the bullet in case or for any center-fire revolver that is to be used other than as a single shot, the following B. & M. Reloading Tools are required.

- 1—B. & M. Model 28 Improved Reloading Tool less Bullet Seating Parts.
  - 1—B. & M. Model 26 Bullet Seater.
  - 1—B. & M. Visible Powder Measure.
  - 1—B. & M. Loading Funnel.
  - 1—B. & M. Rubber Mallet.
  - 1—Pair Loading Blocks.
- Material**—Same as above.



Hardening B. & M. Tool Steel Neck Dies and Expanding Plugs.

Rifles for which cartridges must be crimped if used as repeaters are the Remington Slide Actions (Models 14 and 141), Winchester Lever Action (Models 53, 86, 92, 94, 71, 64, 65) or any other rifle in which the cartridges are inserted into a tubular magazine. Cartridges for use in revolvers and pistols should be crimped if the arm is to be used as a repeater.

For the second class, those who prefer to cast their own bullets (so that a still greater saving may be effected on the ammunition bill) add to either of the above lists of B. & M. Tools the following items—

- 1—or more B. & M. Bullet Moulds, single or double cavity.
- 1—B. & M. Bullet Sizer.
- 1—B. & M. Cake Cutter.
- 1—B. & M. Melting Pot.
- 1—B. & M. Iron Dipper.
- Bullet Lubricant.

**Material**—Bullet metal and, for some cast bullet designs, Gas Check Cups.

In many instances, when only reduced loads are to be assembled and exceptional accuracy is not required, a powder dip or scoop may be substituted for a B. & M. Visible Powder Measure.

## Safety

We have often been asked whether the practice of handloading ammunition is dangerous. It most decidedly is not. We know of no accidents that were not due entirely to defective arms or extreme carelessness. Handloading ammunition does require ordinary care but if the reloader will read the instructions contained in this Handbook carefully before commencing to reload, the practice is perfectly safe. Certain precautions must be observed:

1. Do not smoke while reloading.
2. Do not manipulate reloading tools so as to give a sharp or heavy blow to any primer. Primers normally will not explode from pressure alone. Needless to say handloaders should not attempt to prime cartridge cases which contain a powder charge.
3. When loading powder into cartridge cases be extremely careful not to put two charges into one cartridge case. Many cartridge cases in use to-day were originally designed for black powder and will easily accept a double charge of some smokeless powders. After all cases have been charged examine each of them closely before seating bullets. Charges which may prove dangerous can be detected in this manner.
4. Do not use charges of powder in excess of the maximum charges appearing in this Handbook. Charges considerably less than the maximum should be used at the start. Never exceed a recommended maximum charge.
5. Many cartridge companies are using or have used in the past, a primer (mercuric) which upon firing gives forth a substance that combines with the brass case causing it to become brittle. We therefore caution handloaders not to use cases of unknown quality for reloading purposes. We advise the purchase of new, empty, unprimed cartridge cases and the use of only the latest approved non-mercuric type of primer.
6. Before reloading, cartridge cases should be examined closely for defects. Particular attention should be given to their bases. Cracks are easily detected because the escaping gas blackens the exterior of the shell case around the point at which the leak occurs. A cracked shell case must not be reloaded.
7. Do not continue to fire a lot of cartridges which show signs of developing dangerous pressures. Indications of excessive pressures are undue recoil, difficult extraction of the fired cartridge case, pierced primers or longitudinal streaks appearing on the body of the fired cartridge case. Watch for these indications. Should any be noted, firing should cease and the cause be determined and corrected.



## The Selection and Care of Cartridge Cases

The first models of breech loading firearms were not a success until brass cartridge cases were perfected. The combination of gun and cartridge case, prior to the development of the brass cartridge case, permitted an escape of gas rearward which was disconcerting to the firer and resulted in a loss of power and uniformity of results. The introduction of the brass cartridge case solved these difficulties but it still remains that this component is the weakest that the handloader uses, since rifle barrels and actions in good mechanical repair will withstand far greater pressures than the cartridge cases which are used in them. It is the purpose of this article to explain the proper selection of cartridge cases and care of them.

### Manufacture

Center fire rifle and revolver cartridge cases are manufactured from brass, an alloy consisting of zinc and copper. The percentage of these metals used varies with the manufacturers but usually consists of 68 to 74% of copper and 32 to 26% zinc. One of the properties of brass is, that when cold worked, it becomes harder and more brittle until it finally becomes impossible to work it further. It must then be softened by heating, a process known as annealing. In the manufacture of brass cartridge cases, the alloy is carefully made up and cast into bars of a convenient size which are subsequently passed through rolls and brought to a suitable thickness for the cupping machines which form these sheets into cartridge cases. During these processes it is necessary to anneal the metal several times so that the manufacture can be carried on to completion and the resulting cartridge case will not be too hard or soft. The finished cases are hardest at the base and tend to be softer toward the muzzle. Upon discharge of the loaded cartridge, a properly annealed cartridge case will, without fracturing, expand to and grip the walls of the chamber of the arm and, as the pressure is reduced, will spring back slightly and permit ease of extraction. A case which is too soft will stick in the gun chamber and quite frequently the base will be deformed and the primer pocket enlarged; one too hard is likely to separate either upon firing or extraction. Cartridge cases furnished today are remarkably well made and reloaders seldom experience any difficulty with them.

### Selection

Handloaders should procure for reloading a supply of new unfired cartridge cases. Many used cases may be unfit for reloading purposes. Mercuric type primers make cartridge cases brittle. Most manufacturers of cartridges have used them in the past and some makers may still be using them. These mercuric primed cases should not be reloaded. Many cartridge cases, chiefly those of 30-06 Springfield caliber, were made hurriedly during the first and second World Wars and often contain defective material and frequently are poorly annealed. This type of cartridge case should not be used when assembling full power loads. Finally, cases which have been fired and not properly cleaned or stored may corrode sufficiently to weaken the case walls. While corrosion can usually be detected, the other two factors of quality of cartridge cases cannot be readily observed. The choice of new cartridge cases at the outset is, therefore, strongly advised.

### Care of Cartridge Cases

Fired cartridge cases should be kept in a dry place. Damp cases should be dried at the earliest opportunity. Shell cases should not ordinarily be heated to a temperature greater than can be tolerated by the hand. Therefore, when drying, do not place them on a hot stove top but rather let them dry slowly in a warm but not hot oven with the door open. In reloading, the necks of the fired cases must

be resized to properly hold the new bullet. Resizing necessitates working the brass of the case necks. B. & M. Tools are designed to keep this working of the brass to a minimum and since passing the necks over the dies will properly resize them, they should not be subjected to this strain more than once for each reloading. Another point to be remembered is that bullets, seated in the case necks, exert pressure on the walls which has a tendency to cause the brass to crystallize and crack. This condition is known as "season cracking" and is especially noticeable in war ammunition which has been loaded and stored over a considerable length of time. The life of the case can be longer preserved if the ammunition is not loaded until it is needed.

Handloaders frequently ask us "how many times can a cartridge case be reloaded?" This question cannot be definitely answered but good cases, given the proper care, can be reloaded with full power loads from ten to twelve or more times while if reduced loads are used they may be reloaded from twenty-five to thirty or more times. This estimate is conservative. Many hand loaders report having reloaded cases fifty or more times.

### Cleaning Cartridge Cases

If fired cases are to be stored for any appreciable length of time they may be cleaned to prevent corrosion. An easy and economical method of cleaning them is as follows: remove the fired primers and immerse the cases in a 1% solution of sulphuric acid. The solution of sulphuric acid must be held in a glass or earthenware container. The cases should be immersed in the acid bath for a period of from three to five minutes and then rinsed in clear water. Immediately after rinsing, transfer them to another container in which they can be boiled. This vessel must also contain a sufficient amount of water to keep them immersed. After boiling drain the water and dump the cases on a dry coarse towel and shake vigorously over a hot stove. To insure that the cases are properly dried both inside and outside, dry them as described above under "Care of Cartridge Cases". Do not allow them to overheat as this may cause annealing or softening of the brass. This method of cleaning leaves the cases in a blackened condition but they are thoroughly cleansed and if stored in a dry place, will be preserved from corrosion indefinitely.

Note:—When preparing the acid solution referred to above, add the acid slowly to the water while gently stirring the mixture. Do not introduce water into sulphuric acid.

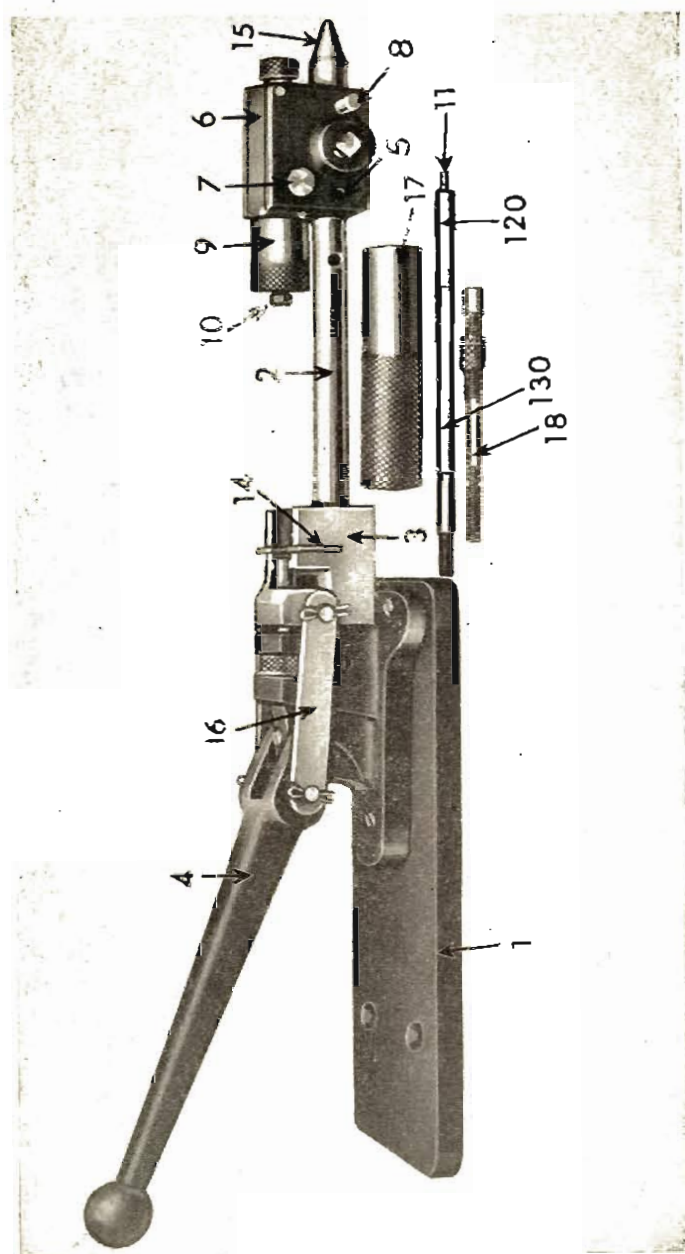
"MAKE THIS NATION AGAIN A NATION OF RIFLEMEN"

JOIN THE NATIONAL RIFLE ASSOCIATION  
1600 Rhode Island Ave. Washington D. C.

THE UNITED STATES REVOLVER ASSOCIATION  
5 Oak Street, Springfield, Mass.

*Belding & Mull Reloading Tools are Endorsed  
by Prominent Shooters Everywhere.*





Belding &amp; Mull Model 28 Improved Reloading Tool, set up for Neck Sizing

## How to Reload with B. & M. Tools

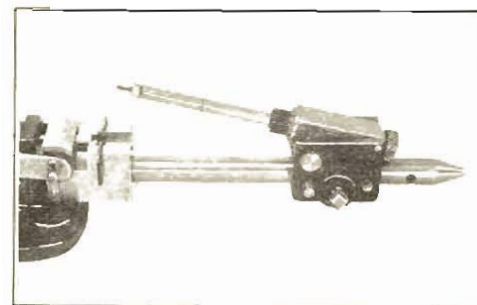
The following operations, in the order of their occurrence, are necessary to reload. The cartridge case (if not a new unfired case) must be decapped and reprimed, the case muzzle resized, charged with a suitable amount of the proper powder and a bullet seated.

### Decapping

To perform the first operation—which is decapping—the set screw (7) is loosened to allow the hinged bar (6) to be raised, and the decapping stem (11) inserted (replacing parts 9 and 10). The head (5) is securely fastened to the half inch rod (2) by the tapered pin (8). If the head is not in the proper position to decap, remove the pin by a light blow from the opposite side, and move the head until the tapered pin can be inserted in the proper hole in the half inch rod. This tapered pin securely fastens and accurately aligns the head to the half inch rod and must always be firmly tapped in place. The empty cartridge case is now slipped over the decapping stem and both dropped into the sliding cradle (14) where they are held centered. As the lever handle (4) is moved forward (be sure the base of the cartridge case is seated in the sliding cradle and the hinged bar is down) the decapping pin enters the primer recess or flash hole and the fired primer is easily pushed out. No large amount of force is required to perform this operation. When added pressure seems to be necessary, the decapping pin may not have entered the primer recess. In such instances, insert the decapping pin in the flash hole before the case is placed in the sliding cradle and thus save the possibility of bending or breaking the decapping pin. The correct use of this attachment is soon learned and seldom do experienced handloaders bend or break B. & M. decapping pins. (Note: the primer is crimped into some cartridge cases, notably those of F. A. make in caliber 30-06. A special decapping pin is required to remove these and the primer recess must be cleared before a new primer can be inserted).

### Repriming

To replace the fired primer with a new one, the lever handle is drawn backward until the decapping pin is withdrawn from the primer recess and the priming punch (12) approaches the case head. The new primer is now dropped into the slot behind the case head and the backward stroke of the handle completed. The priming punch is adjustable, by the large knurled nut (13) to regulate the seating depth



Improved Reloading Tool Set up for Decapping

and to place the primer precisely on the bottom of its pocket. Primers of the correct size seat easily and should fit snugly in the pocket provided for them. They should be seated to a depth slightly below the level of the cartridge case head. If allowed



to protrude above this level, the bolt head of the arm may strike them during the act of closing the action and may thus fire the cartridge prematurely.

### Resizing Case Necks

The necks of fired cases usually need to be resized before they will accept and hold another bullet. In resizing, the decapping stem is removed and the neck die (9) and expanding plug (10) are attached as shown in the illustration. The hinged bar (6) should be locked down by tightening the set screw (7). The outside of the case necks should be slightly oiled to facilitate this operation and also to reduce wear on the dies. The proper amount of oil may easily be applied by touching the outside of the case necks with a mildly oily rag. Care must be observed not to allow oil to get inside the powder chamber for it will dissolve both powder and primer composition, rendering the loaded cartridge useless. The head of the case is placed in the sliding cradle as in decapping and the lever handle moved forward. This movement forces the case neck into the neck die and reduces it in diameter. As the lever handle is moved backward the case neck is pulled over the expanding plug which enlarges it to a uniform inside diameter correct to accept the bullet, regardless of the variable thickness of the case wall. This one operation properly resizes case necks. Do not run the case neck through the die several times in the belief that superior results will be obtained. The expanding plug (10) should be adjusted to the mouth of the neck die and only slightly deeper than the adjustment as illustrated. These parts operate independently of each other. Clearance must be permitted between them so that the case mouth may pass freely over the expanding plug when entering the neck die and, on the backward stroke, expansion must not be restricted by the contracting action of the neck die. The necks of new cartridge cases usually need to be resized before they will accept a bullet. This operation is always necessary if cast bullets are to be used.

Cartridge cases to be used in the same arm in which they have been fired do not require full length resizing. Full length shell resizing is discussed on page 23 of this Handbook.

To facilitate bullet seating the case lips should at this time be slightly belled on the B. & M. crimp remover (part 15) or reamed with a knife or suitable tool.

While this method of fitting cases for bullet seating is satisfactory in most instances, for the convenience of handloaders of revolver and pistol ammunition we have recently developed a special Decapper, fitted with a shoulder to remove crimp. It is faster in operation than the above method. If interested, write for further details. It is furnished on special order only at a slight additional cost.

The cartridge cases have now been decapped, reprimed and muzzle resized and are ready for powder charging. This operation is readily accomplished by employing a B. & M. Visible Powder Measure. A complete description of this tool and the manner in which it operates will be found on page 32 of this Handbook. With this tool charges of any powder available to the handloader can be safely thrown and unless super-accurate loads for target shooting are desired the purchase of a set of expensive scales is unnecessary. This discussion is also followed by a description of and instructions on the use of Charge Cups and Powder Scoops.

The charged cartridge cases are now ready to have a bullet seated in them. At the risk of repetition we wish to state again that the charged cases should be closely examined to detect double charges or no charge at all—errors may have occurred. Any error of this nature that may prove dangerous can be detected by noting the comparative height of the powder column in the cases.

## Bullet Seating

### The Model 26 Bullet Seater

The Model 26 Bullet Seater consists of a Die to hold the cartridge case, a Base and an adjustable Bullet Seating Plunger.

The die holds the cases as in the chamber of a gun. The upper portion of the die corresponds to the bore of the gun, but is essentially a little larger. A bullet slides down it smoothly without cant or wobble. This method of holding the case and bullet is the greatest feature of the tool. The bullet must go into the case true and straight—a fundamental ballistic requirement. The base is recessed on one side. This side is used when seating bullets. The unrecessed side is used when crimping. The bullet seating plunger is bullet diameter and fits the upper section of the die snugly; hence, it pushes only in a straightline. It is threaded for adjusting bullet seating depth and the adjustment is maintained by a split washer and heavy knurled nut under the head.

To seat bullets with this tool the base is used recessed-side up. The charged cartridge case is slipped into the die and both placed on the base casting. The bullet is now dropped into the top of the die and the bullet seating plunger inserted. A few light blows on the top of the plunger with a rubber mallet forces the bullet into the case neck. Proper bullet seating depth is obtained by adjusting the bullet seating plunger. Another and very desirable method, especially when using cast bullets, whose sides are relatively soft and require care to prevent shaving, is to start the bullet by hand in the slightly reamed or belled lips of the charged cartridge case and then insert the combination in the bullet seater die in which the seating plunger has been left in place, to complete the seating operation.

Crimping, itself, is not an aid to accuracy and should be avoided when not necessary. (see page 10). Crimping with the Model 26 Bullet Seater is accomplished by a shoulder in the bullet seating die which, as the cartridge case is forced in, engages the case lips, turning them in against the bullet. To crimp with this bullet seater the bullet is seated, as described above, to a depth where the center of the crimping ring or cannellure of the bullet is parallel to the case lips. The complete cartridge is then inserted in the bullet seating die and both placed on the unrecessed side of the base casting. A few light blows on the top of the die with

a rubber mallet (never use a metal object) forces the case against the crimping shoulder of the die which turns the lips of the cartridge case into the ring on the bullet provided for the purpose, thus crimping and securely holding it in place.

Cartridge cases tend to lengthen if used repeatedly and even new cases of various makes differ slightly in over-all length. It is evident that long cases will engage the crimping shoulder in the die earlier than short ones.

Exceptionally long cases which may be shortened to the proper length with a file or cartridge case trimmer, may be well crimped before their heads are flush with the base of the bullet seating die and if, after the case is properly crimped, additional force is applied, the case may be buckled, necessitating full length resizing, or be deformed so completely that it must be discarded. No great amount of force is required to effect a crimp. A few light taps should be sufficient. The formula for successful crimping is light pressure and frequent inspection. In a surprisingly short time the "feel" of the force necessary to crimp properly is acquired and from then on crimping with the Model 26 tool is swift and accurate.



Model 26 Bullet Seater



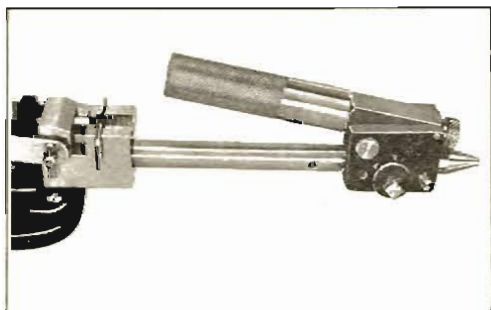
The Model 26 Bullet Seater is made for all standard and popular calibers. Bullet seating dies for 30-06, 30-40 and similar calibers are not furnished with crimping shoulders because these cartridges are never used in tubular type magazine rifles.

The face of the bullet seating plunger is concaved to conform with the shape of the forward section of the bullet. This avoids deformation during the bullet seating operation although a plunger concaved for a pointed or spitzer type bullet will usually seat other types without damage. When ordering always state the caliber and type of bullet to be used.

## The Model 28 Bullet Seater

The bullet seating attachment on the Model 28 Improved Straightline Reloading Tool operates on the straight-line principle in essentially the same manner as the Model 26 Bullet Seater (see above). The interior of the bullet seating die is identical to the Model 26 die and holds the cartridge case as does the chamber of the gun but is without the crimping shoulder. The upper end of the die is threaded for attachment to the hinged bar of the Model 28 Improved head. The bullet seating plunger fits into the head of the Model 28 Improved Tool and is equipped with lock nuts for adjusting bullet seating depth.

The tool, when used for bullet seating, must be placed in an inclined or up-right position to prevent powder being spilled during the process. Parts 9 and 10 (see page 14) are replaced with the bullet seating die and plunger parts 17 and 18.



The Model 28 Improved Tool set up as Bullet Seater

The tool is now ready to seat bullets and the operation is accomplished in either of two ways. The first and preferable method is to start the bullets by hand in the case neck, which has previously been slightly reamed or belled on the crimp remover (part 15) of the tool. The charged case and bullet are then inserted in the bullet seating die and the base of the case placed in the sliding cradle. The hinged bar (6) should be held down firmly by hand. The lever handle is now moved forward until the sliding cradle is stopped by the bullet seating die. This operation seats the bullet and the return stroke extracts the loaded cartridge from the die.

The second method of seating bullets differs from the first in but one particular. If the reloader so desires the bullet may be slipped in the bullet seating die followed by the insertion of the charged cartridge case. Care must be exercised, when using this method, to insure the alignment of the case muzzle with the base of the bullet. The bullet is not properly held in the bullet seating die until it reaches the upper or "bore like" section. Perfect alignment will usually be obtained by rotating the cartridge case a quarter turn or so while the lips are in contact with the base of the bullet.

The Model 28 Improved Bullet Seater does not crimp. It does, however, seat bullets with precision and accuracy and is appreciably faster in operation than the Model 26. Should the purchaser of a Model 28 Improved Tool desire to load a caliber which requires crimping he must use a Model 26 Bullet Seater in

place of standard Model 28 Improved parts. The Model 28 Improved Tool can be purchased with or without bullet seating attachments.

## Fit of Bullets in Throat of Barrel

In a rifle chamber there is a space forward of the point where a chambered cartridge case ends and which has the rifling lands cut away to accept the bullet. This space is sized to accept a certain standard bullet but when bullets other than standard are used it is desirable that the handloader know the depth and diameter of this space. This information can be obtained by making a sulphur cast of the chamber and a portion of the bore from which exact measurements may be had. If at all possible, a bullet should be selected which may be seated to such depth that, when the cartridge is chambered, its forward section almost touches the rifling. While not all bullets have sufficient length or are designed to permit loading in this manner the practice should be followed wherever possible as an aid to accuracy. In cartridges not so loaded, the bullet is permitted either a free jump to the rifling when fired or is wedged against the lands by the closing action of the lever or bolt—both should be avoided. Much valuable information regarding the shape and size of the throat or lead (pronounced leed) of a rifle may be obtained by the following experiment. To determine the proper seating depth of a certain bullet start the bullet, which you contemplate using in the cartridge case. Insert the combination in the gun and close the bolt or lever to a point where the bullet meets the rifling. In following this procedure the cartridge will be removed after each trial and the bullet seated slightly deeper until you have reached the point where the combination chambers freely and the bullet, when the action is closed just touches or nearly touches the rifling. The over-all length of the dummy cartridge will serve as a guide when seating similar bullets.

## Reloading Revolver and Pistol Cartridges

Pistol and revolver cartridge cases are reloaded in the same manner and with the same Tools as are used when assembling rifle cartridges. Their fired cases must be decapped, reprimed, the case necks resized, charged and a bullet seated in exactly the same manner as described under the section of this Handbook dealing with the operation of B. & M. Straightline Reloading Tools.

Fired cases of automatic arms often require full length resizing (see page 23) before the cartridge case can be rechambered in the arm in which it was fired. The B. & M. Bullet Sizer (see page 58) is furnished with a specially hardened die for the purpose of full length resizing the 45 A. C. P. cartridge case. Ideal and Wilson Full Length Shell Resizers may be had from B. & M. for any of the other automatic pistol or revolver cartridge cases which require full length resizing.

There are certain precautions other than those mentioned previously, which the handloader of revolver and pistol cartridges must observe. While pressures developed by full power loads in modern rifles often exceed 52,000 lbs. per square inch, most pistols and revolvers were not designed for pressures exceeding 15,000 lbs. per square inch, or less than a third. Smokeless powder used in reloading these cartridges is fine grained and burns rapidly and efficiently in the comparatively short barrels of this type of firearm. Pressures developed by pistol powders vary greatly for small changes in weight of charge, bullet weight and diameter, alloy, and seating depth. Always start with a charge of powder considerably less than that recommended and gradually work up to the maximum recommended charge, watching carefully for indications of excessive pressure. (See page 30). Not only should bullets be of the same type and weight as those recommended to be used with the powder charge, but if solid bullets are used they should be cast from a hard alloy such as one part tin to fifteen parts lead or harder. Pistol and revolver powders deliver a blow rather than a push to the base of revolver bullets with the result that the bases of bullets cast from a soft alloy tend to "set up" or enlarge as they pass to the rifling and thus increase pressures.

With these additional precautions in mind, pistol and revolver cartridge cases are successfully reloaded. All that has been said of the advantages of reloading rifle cartridges applies equally well to the practice of reloading for pistol and revolver.

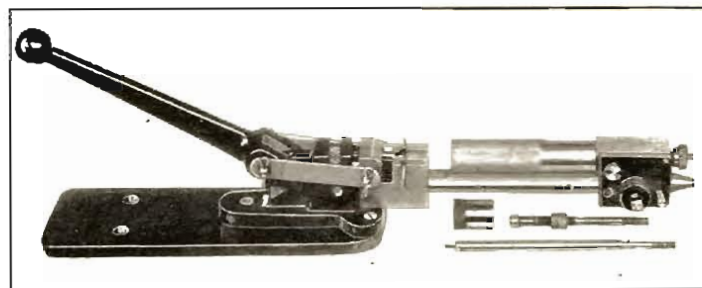


## B. & M. Straightline Reloading Tools

### The Model 28 Improved Straightline Reloading Tool

The Model 28 Improved represents the most recent development in B. & M. Reloading Tools. As furnished with standard bullet seating attachments, it is recommended for use in reloading any cartridge for use in single shot or bolt action rifles when no crimp is necessary or desired. For reloading cartridges which must be crimped, it is furnished less the standard bullet seating attachments but with the Model 26 Bullet Seater.

The Straightline feature has been retained. Several changed in design, however, contribute to make it even easier and more rapid in operation than its predecessor. No auxiliary tools are needed when reloading with the Model 28 Improved. The Decapping Stem, Expanding Plug and Bullet Seating Plunger are held in position in the head by means of a knurled nut. Removal of any of these parts is readily accomplished by releasing this knurled nut and slipping the part from the head. The Decapping Stem requires no adjustment. Adjustments on the expanding plug and bullet seating plunger are made on the parts themselves by means of two knurled lock nuts. Removing these parts from the head does not alter these adjustments. They may be removed any number of times and when replaced always return to their original position. To change the tool from one reloading operation to another requires but a few seconds and, since in making the change no adjustments have



Model 28 Improved Reloading Tool Set Up for Bullet Seating

been altered, it is extremely practical for the experimenter to completely reload as few cartridges as his needs require for testing purposes and, when one of suitable ballistics is found the tool may then be used to assemble accurately and rapidly that load in any quantity required.

The Model 28 Improved may be adapted to other calibers than that for which it was originally obtained (see note top page 22) by the purchase of additional parts. Additional parts for added calibers are as follows:

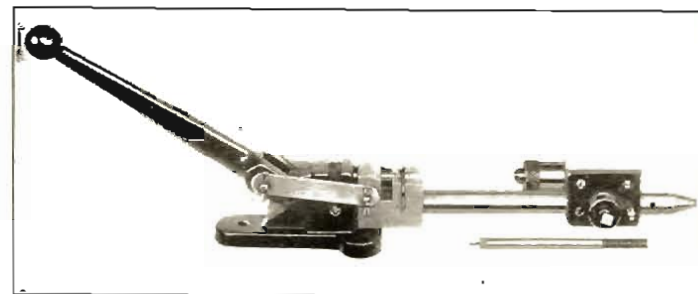
Extra Bullet Seater Die.....	} For prices see our regular Price List.
Extra Bullet Seating Plunger.....	
Extra Expanding Plug.....	
Extra Neck Die.....	
Extra Decapper Complete.....	
Extra Decapping Pin.....	
Extra Sliding Cradle.....	
Extra Priming Punch.....	
Extra Rim Plate (part No. 14).....	

Shipping Weight Model 28 Improved Tool, 5 pounds.

B. & M. Reloading Tools and Other B. & M. Products are recommended

for the individual loading cartridges for his own needs and, if he so desires, for a few of his friends. They are comparatively inexpensive, well made and so compact that they are frequently carried to the range or afield where their services may be required to replenish a dwindling ammunition supply or unload and reload a certain lot of cartridges which may have proven unsatisfactory. They are not recommended for use by groups of shooters such as Rifle Clubs, Police Departments and similar organizations loading as a unit and using comparatively large quantities of ammunition. Such groups will be better served by the purchase on one of the several turret type, semi-automatic reloading tools currently being offered. B. & M. Reloading Equipment has been manufactured and sold world-wide for more than 26 years and has the approval of experienced shooters everywhere. Your satisfaction is guaranteed or your money will be refunded.

The manufacture of the B. & M. Model 26 Straightline Reloading Tool has been discontinued. However, since there are many thousands of them in use by hand-loaders everywhere, and many of these owners wish to convert them to reload a caliber of cartridge different than that for which it was originally fitted, we continue to manufacture B. & M. Model 26 Dies. The illustration is shown herewith as an aid in its identification. The names and numbers of Model 26 Dies correspond with those for the Model 28 Improved as shown on page 14. The Sliding Cradle, and Neck Die for the Model 26 interchange on the Model 28 Improved Tool. The Decapper and Expanding Plug do not. Therefore, if you have a Model 26 Tool and desire additional Decappers or Expanding Plugs, be sure to specify Model 26, because ordinarily, we would ship Model 28 Improved Parts.



Model 26 Reloading Tool Set Up for Resizing

The Model 26 may be adapted to calibers in addition to the one for which it was originally obtained by the purchase of additional parts: (see note top page 22). Parts necessary to adapt the Model 26 for use in reloading other cartridges are as follows:

Extra Sliding Cradle	Model 26 Bullet Seater
Extra Expanding Plug	(complete for one caliber)
Extra Neck Die	Extra Bullet Seating Plunger
Extra Decapper (complete)	Extra Bullet Seating Die
Extra Decapping Pin	Extra Rim Plate (No. 14)
	Extra Priming Punch

For prices see our regular Price List.

Dies are also available on special order for the B. & M. Model 24 Straightline Reloading Tool, manufactured more than twenty years ago; also for the Model 28 which differs somewhat from the Model 28 Improved. However, since not many continue to use the Model 24 and only a limited number of the Model 28 were ever manufactured, no illustrations of these models are shown herein. If your present B. & M. Reloading Tool does not correspond exactly with the illustrations shown or descriptions of either the Model 26 or 28 Improved B. & M. Reloading Tools, write for further instructions before placing an order for additional parts.



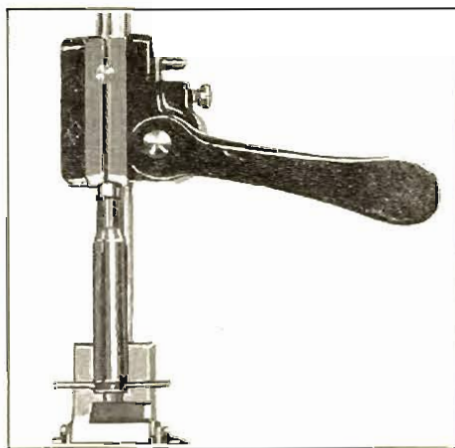
NOTE: Because there are so many possible combinations of calibers which can be had on a B. & M. Reloading Tool, it has not been found practical to publish a list of the extra parts necessary to adapt a tool set up for one caliber to any of the others. Many times some of the parts can be satisfactorily used for reloading several other calibers. We suggest, therefore, when ordering a tool to be used for several calibers or when desiring to adapt a tool to additional calibers, that you write giving us complete information. We shall then be able and pleased to furnish a detailed list of the additional parts required and a statement of their cost.

While not absolutely necessary, we recommend that when additional parts are ordered the Reloading Tool be returned to our factory to insure the proper fitting of parts. When ordering Reloading Tools always state what type of bullet is to be used and whether it is cast or jacketed. Often a sample bullet and fired cartridge case will save a delay in filling orders.

## B. & M. Bullet Puller Attachment

The B. & M. Bullet Puller Head will be found useful from time to time to every reloader of rifle ammunition. It is a necessity to the member of the National Rifle Association who has access to ammunition supplied by the Government at very low prices. With the help of the B. & M. Bullet Puller attachment these cartridges can be conveniently unloaded and reassembled into excellent target or sporting ammunition at a very great saving. By selecting the proper expanding bullet and by using the proper powder charge any special loads fancied can be readily obtained. It will always save its cost in the first hundred cartridges handled in this manner.

The B. & M. Bullet Puller consists of a bullet clamp head designed to replace the fixed head on any model of B. & M. Reloading Tool. The force required to grip



The B. & M. Bullet Puller Attachment

the bullet is obtained by means of a lever cam. The powerful jaws clamp smoothly along the circumference of the bullet and hold it securely. The surface of an extracted bullet is not marred nor is its shape distorted.

The tool when used for pulling bullets should be in an upright position to prevent spilling powder. The elongated base of the Model 28 Improved is especially adapted to bench vise use for bullet pulling.

To pull bullets the head is removed from the tool and replaced by the Bullet Puller Head, which is locked in place by firmly seating the tapered pin, or if the shaft has not been drilled to receive it the Bullet Puller Head may be locked in position by tightening the set screw on the head. With the bullet puller lever upright insert the bullet within the jaws of the Bullet Puller up to the lips of the cartridge case. Raise the loading tool lever and insert the base of the cartridge case in the sliding cradle. Pulling the Bullet Puller lever down firmly clamps the Bullet Puller jaws around the bullet and returning the loading tool lever to its original position extracts the bullet.

Loads on hand undesired because of inaccuracy, recoil, excessive pressures or other reasons, need not be fired or thrown away. They may easily and rapidly be broken down and reassembled into the ammunition desired. Use the B. & M. Bullet Puller and change the loaded cartridges which you have into the loads desired.

Shipping Weight, 1 pound 6 ounces.

Extra Sets of Jaws for additional calibers may be fitted to the Bullet Puller attachment. When ordering please forward your Bullet Puller Head for fitting, and state caliber desired.

## Primer Pocket Reamer

For removing the crimp from the primer pocket of Frankfort Arsenal and other caliber cases using large size primers.

Shipping Weight—4 ounces.

## Full Length Shell Resizing

The cases of cartridges fired in arms in good mechanical repair, other than automatic arms, do not expand to the extent that they will not rechamber easily in the same arm when reloaded. With few exceptions it is not necessary and is not advisable to full length resize fired cartridge cases. However, all cartridge cases used in auto loading arms expand excessively and must be resized full length before reloading. With the exception of the 45 A. C. P. and a few other automatic pistol calibers, the practice of reloading cartridges for use in automatic arms is impractical.

We regularly furnish a full length shell resizer for the 45 A. C. P. case similar to our Bullet Sizer described elsewhere in this catalogue. Due to the variation in the diameter of chambers of rifles, cartridge cases fired in one arm often must be resized full length for use in another of the same caliber. Some shooters prefer to full length resize a lot of cartridge cases which are to be reloaded for use in the game fields; it insures that they will chamber easily and guards against the possibility of one failing to eject easily upon firing. For those shooters, we furnish a full length resizing Tool of "Ideal" or Wilson manufacture for all popular calibers.

The outsides of the cartridge cases to be full length resized should be slightly oiled with an oily rag to facilitate the operation and to reduce wear of the die to a minimum. Oil must never get inside the cartridge case. An excess of oil will trap air within the die and as pressure is applied longitudinal creases will form in the shell case.

In operation, the cartridge case is started in the die and the combination inserted in a bench vise which is used to force the shell its entire depth into the die. Care must be exercised to apply the required force in a straight line. A punch is provided to drive the resized cases from the die. Shipping weight 12 ounces.



Ideal Shell Resizing Tool



## Primers and Powders

### Primers

The uncertainty and difficulty of ignition of the powder charge severely limited the general utility of the earliest firearms. The first "primer" system consisted of a pan, which contained the priming charge, covered by a lid which protected the powder then used from the elements. Ignition was effected by raising the lid and applying a smouldering cord or slow match. The wheel lock followed but was a complicated arrangement and was superseded by the flint lock about 1600. This method of ignition was employed for two centuries or until the discovery and adaption of the percussion system in 1805. Percussion caps such as those used to fire muzzle loading arms are common to-day. The breech loader presented new ignition requirements which were met by the adaption of pin fire and needle mechanisms. Rim fire and center fire cartridges followed. Practically all of our modern cartridges are now of the center fire type, an exception being the popular 22 caliber rim fire cartridge. Because of the difficulty of repriming, it is not possible to reload rim fire cartridges.

Repriming center fire cartridge cases, however, may easily be accomplished. Primers for American cartridges consist of shallow copper or copper alloy cups which contain the priming mixture and an "anvil". In repriming, the fired assembly is forced out and a fresh primer inserted. This is done in one operation with B. & M. Reloading Tools.

It is not practical to discuss at any length the composition of the priming mixture as it is different in each make of primer. The ideal primer is one which is capable of generating enough heat to effect certain and uniform ignition of the powder charge, and leaves no residue which will cause corrosion of the rifle bore or damage the fired cartridge case. Remington Arms Company, Winchester Repeating Arms Company and Western Cartridge Co. manufacture respectively the popular "Kleanbore" and "Stayless" brands of primers which are non-mercuric and non-corrosive and are the type reloaders should use. Handloaders, when obtaining primers, should state specifically they want only the non-mercuric non-corrosive type. We carry a complete stock of all sizes of primers manufactured by the above companies from which we are able to fill your orders immediately. We also have in stock or can obtain primers of all other makes when these are requested.

### Choosing the Proper Primer

Primers are manufactured in two styles; a heavier one for rifles and a lighter one for revolvers or pistols. The only practical difference in these is in the thickness of the material used in the primer cup. Rifle cartridges develop higher pressures than pistol or revolver cartridges and therefore the material used in the manufacture of rifle primer cups is heavier than that used in pistol or revolver primers. Only rifle primers should be used when reloading rifle cartridges and, similarly, pistol or revolver primers should be used only in pistol cartridges. Aside from the question of pressures, mainsprings used in hand-guns are comparatively weak and often will fail to fire rifle primers, while the rifle mainspring may have sufficient power to drive the firing pin through the cup of the revolver primer allowing a mild escape of powder gas rearward. There are a number of cartridge cases which are adapted for use in either rifles or revolvers; therefore, when ordering, always state whether a rifle or revolver primer is desired.

### Size

Rifle and revolver primers are each manufactured in a large and small diameter. The large rifle primer and the large revolver primer measure .211 in diameter. The small rifle primer and the small revolver primer measure .175 in diameter. On page 61 will be found a table of Jacketed Bullets, Primers and new empty Cartridge Cases, which lists all of the most popular calibers of cartridges. In the second column of this table, opposite each of the various calibers, will be found the proper size, designated by a number, of Remington, Winchester or Western non-mercuric, non-corrosive primer for that caliber. For example, your arm is a 22 "Hornet" caliber. Opposite the 22 "Hornet" caliber in the primer column you will find "Remington No. 6½, Winchester No. 116 or Western No. 6½." The proper size primer for the 22 "Hornet" cartridge is therefore either a Remington No. 6½, Winchester No. 116 or Western 6½. Order primers by number and brand and avoid all possibility of error.

The Remington No. 9½ and Winchester Nos. 115 and 120 are the large diameter rifle primers. Winchester No. 116 and Remington No. 6½ are the small diameter rifle primers. Remington No. 2½ and Winchester No. 111 are the large diameter pistol primers and Winchester No. 108 and Remington No. 1½ are the small diameter pistol primers.

Shooters can readily select the proper Remington, Winchester or Western primer by referring to this table. If primers of other manufacturers are desired, specify whether for rifle or revolver, caliber and type (whether non-mercuric or otherwise.) Practically all commercial primers are now of the non-corrosive, non-mercuric type.

### Gunpowders

While still a matter of some controversy, the discovery of gun powder is generally accredited to Roger Bacon who recorded its formula in 1248. The substance was not, however, extensively developed until the invention of fire-arms in the 14th century. The formula which Bacon recorded is that of black powder. Improvements have consisted only in the refinement of the materials (sulphur, charcoal and salt peter) which enter into it.

The discovery of gun cotton in 1845 led the way to the development of smokeless powder for use in firearms. Considerable time elapsed after the discovery of gun cotton before any safe method of manufacturing it was devised. Smokeless powders for use in shotguns were brought out in 1867 but it was not until 1884 that a successful smokeless powder for use in rifles was introduced. Since that time a large number of similar smokeless powders based on the original discovery of gun cotton have been developed.

The handloader should understand the chief characteristics and recommended uses of the powders available today before commencing to reload. A brief discussion of the several classes and kinds follows. Powders may be divided into two general classes, black and smokeless.

### Black Powder

In this age of modern smokeless, there is little demand or legitimate use for black powder. It is the only powder properly used in muzzle loading arms. In a few of the old cartridges, proper loads of black powder still give results slightly superior to any smokeless load. It is better adapted for use in straight sided or slightly tapered cartridge cases but some useful loads for modern arms may be had. Upon combustion, it creates a heavy smoke, leaves a large amount of residue in the bore and with its high velocities cannot be obtained.



Black powder is a mechanical mixture of sulphur, charcoal and salt peter. The rate at which it burns, since it is all of the same composition, is governed largely by the size of the grains. The finer the granulation the more rapidly it burns. Fg is the coarsest granulation commonly used in firearms and is the slowest burning size available to handloaders. It is adapted for use in large caliber cartridges like the 38's and larger when the cartridge case has a comparatively large capacity and a heavy bullet is used. FFFg is the next smaller granulation and is recommended for use in smaller caliber cartridges like the 32-20, 38-40 and similar sizes. FFFFg, a finer granulation than FFFg, is used in shotgun shells and in small capacity revolver cartridges.

When assembling cartridges in which black powder is the propellant, the charge should not be unduly compressed or crushed by the base of the bullet, for in so doing the granulation will be made finer, thus increasing pressures, and uniform results cannot be obtained.

### King's Semi-Smokeless

This powder is practically the same as black powder except that it burns cleaner and creates less smoke. What has been said regarding the use of black powder applies equally well to King's Semi-smokeless. A finer granulation in this type is available and designated as FFFFg for use in small capacity revolver cartridges. At this writing, King's Semi-smokeless powder is not being manufactured.

### Smokeless Powders



Gunpowders

Smokeless powders have almost entirely replaced black or semi-smokeless powders in all cartridges for use in firearms. When properly loaded, they burn cleanly, cause no objectionable smoke and leave little or no residue in the bore. They have proven entirely satisfactory for use in all calibers of rifles, revolvers and shotgun cartridges.

Charges of smokeless powders are given in terms of weight (grains) and not by bulk as is sometimes the case with black or semi-smokeless powder. Black powders are mechanical mixtures and should two different sizes be mixed, the average characteristics of both would be obtained, but smoke-

less powders are chemical combinations and should different types be inadvertently mixed the lot should be discarded. Their rate of combustion and therefore the developed breech pressures vary greatly. The shape and size of the grain, coating, structure, etc., all combine to regulate the rate of combustion and are different for each brand of powder. A brief discussion of the various types of smokeless powders follows. Those adapted for use in firearms may be divided into the following classes:—Military Smokeless, Bulk Smokeless, Pistol and Shotgun Powders.

#### MILITARY SMOKELESS

Recommended for full power rifle loads

The powders of this class which are available to the handloader are DuPont Nos. 3031, 4227, 4198, 4320, 4064, 4350, Hercules "HiVel" No. 2 and 2400. These powders are progressive burning and with the exception of Nos. 4227 and 2400 are coarse grained. The grains are usually tubular and non-porous and can burn only layer by layer.

The outer layers are coated with a substance which retards the rate of combustion in its early stages. They impart a push rather than a blow to the base of a bullet. As the bullet progresses up the bore of the arm the rate of combustion of the powder grains increases, thus maintaining pressure and developing high bullet velocity. These powders are adapted for use only in full power loads for rifle cartridges employing jacketed bullets.

DuPont Nos. 3031, 4198, 4064 and Hercules "HiVel" No. 2 are recommended for use in calibers like the 25 Remington Rimless, 250 Savage, 270 Winchester, 30-06 Springfield, 30-40 Krag and other similar bottle necked cartridges. Of these DuPont No. 3031 and Hercules "HiVel" No. 2 are the most popular, though any of the four may be used satisfactorily. No. 4320 is particularly adapted to the 30-06 cartridge but many loads for similar cartridges are listed. DuPont No. 4227 and Hercules No. 2400 are adapted for use when reloading the popular Hornet cartridge and are well adapted for use in other similar cartridge cases. DuPont No. 4350 is a slow burning propellant used in the larger caliber military and sporting cartridges with fairly heavy bullets.

Full power charges listed for these powders are usually maximum and represent the amount which cannot be exceeded with assurance of safety. They are not necessarily the best. Handloaders will frequently find that improved accuracy will result when the maximum listed charges are appreciably reduced. These powders burn efficiently only within certain pressure limits. Slight over charges build up dangerous pressures while greatly reduced charges will not burn cleanly or uniformly.

#### BULK SMOKELESS

Recommended for reduced rifle loads

Bulk Smokeless Powders were the first smokeless propellant introduced to supplant black powder and quite a large number of kinds have been manufactured and used. These powders were loaded "bulk for bulk" with black powder, i.e., a measuring device designed for black powder would, when filled, contain the correct charge of bulk smokeless for the cartridge for which it was intended. While these powders were smokeless and convenient to load, they possessed several disadvantages and the manufacture of them has now been largely discontinued, there being but two true bulk smokeless powders (DuPont Bulk Smokeless and Hercules EC, both shotgun powders) available at this time. Since they were loaded like black powder, the nominal full power load being the cases in use at the time, filled, there was not much danger of overloading and reduced loads were obtained by simply using less powder. Reduced loads are now largely obtained by using DuPont Nos. 4759 Rifle Powder and Hercules Unique. These and DuPont No. 80 Rifle (discontinued) are sometimes erroneously termed bulk smokeless powders. We sometimes speak of them as "bulk" smokeless powders. These powders are fine grained and burn rapidly. They are not progressive burning and, consequently, highest velocity loads cannot be obtained. They are however the powders to use when making up reduced loads for modern rifles, loads approaching standard black powder pressures and velocities in the older types of rifles, and loads for a number of the larger caliber pistols and revolvers. Powder charges for these are always given by weight.

Because DuPont No. 4759 is new and the manufacturers no longer publish loading data, complete loading information on this propellant is not available at this time. A limited number of loads for it appear on page 113 of this Handbook. Generally speaking, the use of powerful primers like Remington No. 9½ and Winchester No. 120 should be avoided when this powder is employed. We suggest the use of Winchester No. 115 or the F. A. No. 70 primer.

Hercules "Sharpshooter" and "Lightning" are dense types of powders but burn efficiently at medium pressures. "Sharpshooter" is especially adapted for use in full power loads in straight taper rifle cartridge cases like the 45-70, 45-90, 32-20, etc. "Lightning" is adapted for use in full power loads for the 30-30, 32 Winchester Special, and similar cartridges. Both of these powders are extensively used when making up mid-range loads for the more powerful cartridges.



### SMOKELESS PISTOL POWDERS

These are fine grained quick burning smokeless powders designed to burn cleanly at low pressures in short barrels. Hercules "Bullseye" and DuPont Nos. 5066 and No. 6 are the three pistol powders available to handloaders. DuPont No. 4759 and Hercules "Unique," both "bulk" smokeless powders, are also used extensively in large caliber pistol cartridges by many handloaders. Pistol powders are not adapted for use in rifles except possibly for very light charges.

### SMOKELESS SHOTGUN POWDERS

These Powders are fine grained and are designed to burn efficiently in shotguns. The bore of the shotgun is relatively large and smooth and the resistance offered by the shot charge and wads is less than is the case with rifle and revolver bullets. The use of these powders other than in shot shell loading, is not advised. Under this classification are Hercules "Herco" and DuPont "Oval" which are progressive burning shotgun powders recommended for use in high velocity shot shell loads. Hercules "E. C." and Red Dot, DuPont Smokeless and MX are used in medium power game loads and for trap loads.

## Selecting the Proper Powder

It will be seen from the foregoing discussion that the choice of a proper propellant is not a difficult matter. For all loads developing high velocities in modern rifles, the choice of a progressive burning military smokeless powder is indicated. For reduced or midrange loads for these rifles and for reduced or full power loads in the older models of rifles designed for black powder, modern "bulk" smokeless (DuPont No. 4759 and Hercules "Unique") is the type of propellant to choose. Pistol or revolver cartridges will require the choice of a pistol powder, and shot shells the proper shotgun powder according to the type of load desired. We make no recommendations as to the choice of a Hercules or DuPont powder. Both brands are manufactured by reliable companies and have proven entirely satisfactory for the uses recommended. All DuPont and Hercules No. 300\* are single base (Nitro-cellulose) powders. Hercules "HiVel" No. 2, "Lightning," "Sharpshooter," "Unique" and "Bullseye" are double base powders. A double base powder is one containing an appreciable quantity of nitroglycerine.

We hope that the reader, having read the foregoing matter in connection with the various powders available to the handloader, has been able to form some very concrete ideas as to his requirements. If such is not the case we trust that sufficient interest has been developed, that he will not hesitate to write to us for our suggestions as to the specific powder for his particular needs.

We carry a complete stock of powders of American manufacture. Frequently in articles on handloading, many powders not listed herein will be mentioned. In most instances, the powder has been discontinued by the manufacturer or was never generally supplied to handloaders. Hercules HiVel No. 3 has been discontinued. DuPont Nos. 1204, 25½ (never available to handloaders), 17½, 1147 and 15½ have been superseded by DuPont Nos. 4227, 4198, 3031, 4320 and 4064 respectively. DuPont No. 4759 replaces DuPont No. 80.

DuPont powders are available in the following sizes of containers; Nos. 4227, 4198, 3031, 4320, 4350 and 4064 in canisters containing one pound or in 20 pound kegs; Nos. 5, 6 and 4759 in 8 ounce canisters. DuPont Smokeless Shotgun powder is packed in 8 ounce canisters, and in 3, 5, 10 and 25 pound kegs; MX in 8 ounce canisters, 4 and 8 pound kegs; Oval in 8 ounce canisters. Hercules HiVel No. 2 and 2400 are packed in canisters containing one pound and in 5 and 20 pound kegs. Hercules Bullseye is packed in canisters containing 11 ounces and in 3 and 15 pound kegs. Hercules Unique is packed in canisters containing 13 oz. and in 4 and 15 pound kegs. Hercules Red Dot is packed in 3 and 23 pound kegs only. Hercules Sharpshooter is also supplied in kegs only of 18 pound capacity. Herco and Infallible in 27 pound kegs. Canisters of King's Semi-smokeless powders contain 12½ ounces. DuPont and Hercules black sporting powders are packed in pound canisters and in 6¼ and 25 pound kegs.

\*Obsolete

The powders mentioned in this Handbook are manufactured by the following companies:—E. I. DuPont de Nemours Company, Military Sales Division, Wilmington, Delaware; Hercules Powder Company, Wilmington, Delaware and the King Powder Company, Cincinnati, Ohio.

Weights of all powders and powder charges are stated in the United States as Avoirdupois. There are 7,000 grains in an Avoirdupois pound and an Avoirdupois pound contains sixteen (16) Avoirdupois ounces. The unit of weight, the grain, is the same in Avoirdupois, Troy and Apothecaries systems.

Powders furnished handloaders are of standardized lots. They develop pressures in accordance to published lists of recommended charges. The powder used in commercial ammunition, though perhaps similar in appearance, differs in standard to that which the handloader can buy. It is therefore not practical to break down factory loaded cartridges and attempt to duplicate the ballistics of the factory load by using the same weight charge of canister powder.

Pyro D. G., once obtainable from the government, is a discontinued military smokeless powder frequently used by handloaders and is similar to DuPont No. 20 and Hercules No. 308, both of which have been discontinued. Lots of Pyro D. G. vary in performance and only charges recommended on the canister should be used. The same applies to I.M.R. No. 4893, the current number being supplied by the Government. This propellant has been described variously as being similar to DuPont I.M.R. No. 4064 and 4320.

When war ammunition is to be broken down, a safe manner in which to arrive at a proper load is to average the weight of the charge used in ten of these cartridges. This average charge or slightly less may then be used with the same type and weight of bullet.

## The Powder Charge

The selection of a suitable powder and bullet for the type of cartridge desired has been made, we presume, in accordance with the suggestions and recommendations contained in this Handbook. The handloader is now prepared to develop a powder charge which will produce the desired results.

As the powder charge is developed two facts must be considered. The charge must not develop excessive breech pressures and accuracy of a high order should be obtained when the loaded cartridges are tested.

## Breech Pressure

Breech pressure cannot be measured accurately except by employing a pressure gauge—equipment few riflemen possess. The manufacturers of powders do, however, conduct extensive tests of all of the powders they manufacture. Until recently, the results of these tests were printed and made available to handloaders by placing them on the canister in which the powder was sold and, in greater detail, in separate leaflets. This service has now been discontinued and at this time, we know of no source where such information may be obtained. The manufacturers of powders available to the handloaders do, however, advise us that they expect to continue to control, so far as good manufacturing practice is concerned, future lots of canister powders (that furnished the handloader) to insure that they will be as nearly similar in quality as possible to past and present lots. We feel, therefore, that the data furnished by the powder manufacturers in the past may be used safely in conjunction with present lots of powders. A list of charges compiled from this source of information is contained in this Handbook. It is up-to-date and reliable and we recommend that handloaders be guided by it. The charges as listed give the caliber of the cartridge, the weight and type of bullet and velocity developed. In many instances but one charge is listed for any given weight of bullet and is the maximum charge which cannot be exceeded with assurance of safety. If two or more charges are listed for the same weight of bullet the highest represents the maximum



charge. If no charge is listed for the exact weight of bullet to be used, the approximate weight of the charge can be determined by noting the charges listed for heavier and lighter bullets. It is a simple task to compare the bullet weights and listed charges and to compute the approximate charges to be used with your bullet. When computing charges in this manner it should be borne in mind that, as the weight of the bullet is increased, a corresponding reduction in the weight of the powder charge is necessary. Maximum charges are not, as a rule, the most desirable and are given only to guide the handloader with regard to the upper limit of safe breech pressure.

Almost all factory loaded cartridges are full power loads and contain approximately maximum powder charges which, in turn, produce high bullet velocities. The pressure developed by any powder charge deforms the bullet to some extent. Maximum charges cause the greatest deformation and bullet deformation is a very important cause of inaccuracy. If for any reason maximum bullet velocity is required, the maximum powder charge should be worked up as described below. The shooter is interested in developing either a nearly full power load of maximum accuracy or a less expensive, super-accurate, reduced load. Because arms differ in many particulars a charge which will prove most accurate in your arm can be determined only by experimentation. The maximum charges listed in this Handbook are of very definite value because they will develop the maximum safe breech pressure in standard arms when modern, standard components are used. They provide a starting point from which the handloader can by experimenting develop a charge which will, when used in his arm, produce a superior load for his particular shooting requirement.

## How to Develop Safely the Powder Charge

We suggest that the powder charge, whether it is desired to obtain maximum bullet velocity (full power loads) or maximum bullet accuracy, be developed in the following manner.

Charges listed, if maximum, should never be used at the beginning. We recommend that the listed charge be reduced ten percent or more. This reduced charge should be loaded into at least ten cartridges. These should be fired, using a good rest, and the target retained. Watch carefully for the signs of excessive pressures as described below. If no signs of excessive pressure appear lots of cartridges may be loaded with successively heavier charges until the maximum listed charge is reached or maximum accuracy as shown by the targets has been found. Each succeeding charge should not be more than two percent heavier than the preceding one. When the desired charge is found a careful record of it should be made for this information is infinitely superior for your own guidance in future loading than that which is obtained in any other manner.

## Indications of Excessive Pressures

The appearance of the fired primer has long been regarded as one of the very good indications. Formerly if the edges of the primer cup were flattened against the breech block or bolt head, pressures developed were regarded as approaching maximum. However, some brands of modern primers flatten excessively even when fired without powder charges and thus a flattened primer is not always an indication of excessive pressures. However, if upon firing a loaded cartridge a portion of the primer cup is blown out or extruded into the firing pin recess, we have an indication that maximum pressure has been reached.

Cartridge cases which are difficult to extract because of excessive expansion or which have latitudinal streaks along their sides are also, in most instances, an indication of excessive breech pressure. Another indication is the expansion of the primer pocket in the head of the case. When this happens powder gas will escape freely around the primer.

It should be noticed that, if improper primers are used or if the primers are made of weak material, metal from the primer may be extruded into the primer recess by normal loads. Similarly, soft brass cartridge cases may expand excessively and be difficult to extract, poorly annealed brass in the cartridge case head may deform under normal pressures and lastly, good quality cases fired in oversized chambers will be expanded abnormally and develop latitudinal streaks. However, should any of these signs appear they must be regarded as an indication that in your arm, using those components, the highest permissible breech pressure has been reached. If the powder charge used is nearly a maximum one, reducing it slightly should correct the trouble. If a slight reduction in the powder charge does not correct the trouble the fault will probably be found in the components and the remedy is the substitution of proper standard components for those which have proven defective. Never continue to fire a lot of cartridges which show signs of developing excessive pressures. Any or all of these signs will appear to the observant handloader before pressures have been reached which will cause damage to the arm or endanger the firer.

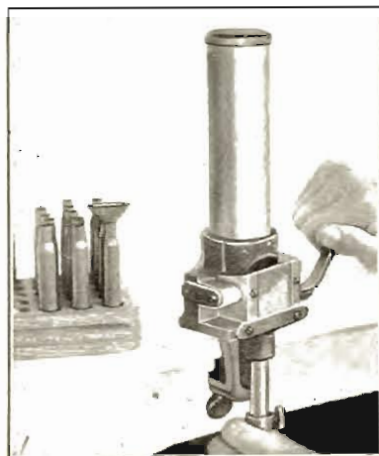
We strongly recommend that the handloader develop each new load in accordance with the above instructions. This method is safe and will produce the super-accurate cartridges demanded by the modern shooter.

NOTE: The pressures developed in modern rifles by normal charges used in conjunction with lead bullets are low. Select charges from the information given in this Handbook according to the bullet velocity desired. A slight overload may damage an alloy bullet causing inaccuracy, a condition that will be readily determined by an examination of the target. Excessive, double or lack of any powder charge should be detected by an examination of the charged case before bullet seating.

Jacketed bullets may be driven at much higher velocities than those indicated in the table of Reduced Charges. Due to the nature of "bulk" smokeless powders (Unique and No. 4759), high velocities cannot safely be obtained with them. Use only progressive burning military smokeless powders to obtain high velocity loads.



## The B. & M. Visible Powder Measure



The B. & M. Visible Powder Measure

Due to its unique construction, the B. & M. Visible Powder Measure is by far the most accurate tool of its kind obtainable. Most powder measures of to-day have but one hopper which feeds directly into a measuring chamber, with the result that the height and density of the powder column in the hopper have a direct influence on the weight of the powder charge thrown. Thus a full hopper of powder throws a heavier charge than one a half or a third full. The B. & M. Visible Powder Measure overcomes this fault because the main hopper is not connected to the measuring chamber. The powder is fed from the main hopper into a secondary hopper or charger reservoir and from this into the measuring chamber. The charger reservoir is disconnected from the main hopper when it is connected to the measuring chamber. Thus the height of the powder in the main hopper has absolutely no effect on the weight of the charge thrown. This feature largely accounts for the remarkable accuracy of the B. & M. Visible Powder Measure. Successive charges thrown by it vary so slightly in weight that only by the most careful and tedious manipulation of a set of balances can the handloader obtain more uniform powder charges. It is the most accurate powder measure available.

The Tool is designed to be clamped by means of a thumb screw to a shelf or work bench. The upper reservoir or main hopper may now be filled with powder to any desired height. As the main hopper is filled the powder runs down and nearly fills the charger reservoir which is equipped with a glass front through which the powder is clearly visible. The charge tube or measuring chamber is graduated in numbers from one to thirty-five and is easily adjusted by means of a thumb screw. The table on the next page is a table which lists all the powders available to the handloader and shows the weight in grains of the charge thrown by the measure for each kind of powder when the charge tube is set at any given graduation. Setting the charge tube at the proper graduation to throw a given charge of a certain powder requires but a few seconds. Measuring powder with the B. & M. Visible Powder Measure is equally simple. After the main powder hopper is filled and the charge tube properly set the latter is inserted in the measure as far as it will go and held in place as shown in the illustration. The lever handle is now

pushed to the right a full stroke, held there until the charge tube is filled, and then returned to its original position. The powder runs smoothly and evenly from the charger reservoir into the charge tube. The B. & M. Measure does not require and should not be pounded or hammered. The contents of the charge tube may now be funneled into a primed cartridge case. When the lever handle was moved forward the charger reservoir was first completely disconnected from the main hopper and then connected to the passage leading to the charge tube. The return stroke of the lever disconnected the charger reservoir from the charge tube and as the stroke was completed again connected the charger reservoir with the main hopper. Thus there is always a constant amount of powder in the charger reservoir when it is connected to the charge tube and the density of the powder column is the same for each successive charge. The glass front of the charger reservoir permits the operator actually to see the powder run into the charge tube, and if the charger reservoir does not refill when the lever is returned to its original position warns him that the main hopper is empty. When the charge tube is removed after the completion of the full stroke of the lever, the operator really sees the full and accurate charge before it is funnelled into the cartridge case.

NOTE: For the benefit of those handloaders loading for the "Magnums" we have developed a Charge Tube Assembly longer than standard, with graduations to 50. These will contain up to approximately 80 grains for the powders commonly used in this caliber of firearm. It is available on request at a slight extra charge.

The B. & M. Visible Powder Measure is so remarkably accurate that the purchase of an expensive set of balance scales is unnecessary. It is safe, reliable and convenient.

Every handloader should own one of these precision instruments.

Shipping weight, 3 pounds 8 ounces.

### CHECKING THE SLIDE SETTINGS OF THE B. & M. VISIBLE POWDER MEASURE

The accompanying table of "Slide Settings—B. & M. Visible Powder Measure" has been carefully compiled and verified by testing with current lots of powders in use at the time of issue and will be found sufficiently accurate as a guide for measuring powder charges for use in all low or medium power loads. However, owing to the fact that the specific gravity of different lots of the same kind of powders varies slightly—a condition over which we have no control—the data contained herein cannot be guaranteed to be absolutely accurate. Of this feature, Wallace H. Coxe, Ballistic Engineer, of the E. I. DuPont de Nemours Company remarks:

"There has always been a slight variation in the relation of the bulk to the weight of all types of propellant powders. With black sporting powders and the obsolete type of 'bulk for bulk' smokeless powders, this difference ratio was less important than it is today.

"Modern smokeless powders are designed to produce more uniform results and this is better achieved by controlling the weight of charge rather than its bulk measurement. This practice has in turn reduced the variations that existed in bulk measurements but not entirely eliminated them. Hence, each successive lot of any particular lot of canister powder will perform as the previous lots when the same approximate weights of charge are used. It is recommended, therefore, that after a shooter has learned to throw consistent weights of charge with his powder measure, he compare the actual weights of charge thrown at each setting of his powder measure. If he finds that the weighed charges do not check with the published table of approximate settings then he should make adjustments accordingly.

If the loader does not have an accurate balance of his own, the neighborhood druggist may be willing to help him.

From the foregoing, it will be noted that when the handloader desires to duplicate the ballistic properties of a load which he has developed and found satisfactory using a certain lot of a given kind of powder, it is advisable to check the slide setting of the B. & M. Visible Measure in order to obtain the same weight of charge when powder from another lot is used.

Note also, that when the loader is using a maximum or nearly maximum load of a given lot of powder, it may not be safe to use this slide setting when a new lot is to be used. Dangerous pressures can result from this practice. Verify the weight of charges thrown before loading high power loads from a new lot of powder. Once the correct setting is obtained, it will not be found necessary to check the weight of succeeding charges from that lot when the B. & M. Visible Powder Measure is used.







## Loading Blocks



Loading Blocks to hold cartridge cases during the reloading process are a necessary part of every reloaders equipment. They may be purchased from B. & M. or made by the reloader if material is available. They consist of hardwood boards, 8x4x1 inches, in which have been bored holes of the correct diameter to accept the base of the cartridge case. B. & M. furnish Loading Blocks of planed oak, varnished, containing fifty holes of any caliber desired. The corners have been rounded and the blocks grooved along their length to facilitate handling. They are

usually sold in pairs. When ordering state caliber desired.

Shipping weight 12 ounces each

## B. & M. Loading Funnels

The powder charge must be funnelled into the cartridge case. Funnels are therefore a necessary part of every reloaders equipment. B. & M. furnish aluminum funnels with mouths large enough to accept charges from scale pans, and tapered to various sizes to fit case muzzles.

Shipping weight 8 ounces.

## Measuring Powder with a Charge Cup



B. & M.  
Charge Cup

While we are of the opinion that all handloaders should own and use a B. & M. Visible Powder Measure, we realize that due to the added expense many beginners do not care to obtain one at the outset. For these handloaders, scoops or Charge Cups for loading reduced loads for rifle and pistol ammunition may be substituted with fairly satisfactory results. These Charge Cups, manufactured to hold any practical reduced load for rifle or revolver

ammunition, may be purchased from B. & M. or they can be made up by the shooter if he has access to a sensitive, accurate scale for testing. Secure an empty cartridge case of the proper size and file off the muzzle end until it will hold the charge desired. Soldering a handle of wire or other material to the dip completes the Charge Cup.

The proper way to use a Charge Cup is as follows: fill a box with powder to a depth approximately twice the length of the Charge Cup. Then push the Cup bottom first, down in the powder until the top is completely covered. Lift the Cup straight up out of the powder with a card scrape off the excess powder flush with the top of the Cup, and then funnel the remainder into the cartridge case. Never scoop the powder into a Charge Cup. If you desire to obtain fairly uniform results let it run in of its own weight as described above.

Charge Cups are satisfactory only for reduced loads in rifle and pistol ammunition. Extremely accurate results cannot be obtained.

Unless checked on a good balanced scale, charges of smokeless powder approaching maximum in either rifle or revolver ammunition must not be measured with a Charge Cup. We strongly recommend the use of the B. & M. Visible Powder Measure for the measuring of all powders.

Shipping weight of Charge Cup 4 ounces

## Lead and Jacketed Bullets

### Selecting The Proper Rifle Bullet

The first projectiles used in firearms were arrows. Bullets cast from lead or lead alloys soon followed, and bullets of these materials were universally used prior to the introduction of smokeless powder. With the development of smokeless powder, bullets having a lead core but protected by an outer jacket of copper or copper alloys came into general use.

Bullets used today are of many designs, types and weights. They are the result of lengthy experimentation dating from the invention of firearms and new designs are constantly being added as they prove their worth. From this array may be chosen types and weights exactly suited for any shooting purpose. The purpose that the cartridge is to serve and the range at which it will be used largely determine the choice of the proper bullet. Considerations effecting the choice of a bullet for target shooting purposes are its design and the range over which it will be used. In choosing a bullet for sporting purposes the size and species of game, shocking power, penetration, and other factors must also receive consideration.

After having made a thorough study of the following pages on bullets, if there should remain any doubt in the mind of the shooter as to the selection of a proper bullet for his needs, we trust that he will write informing us of the type of shooting he desires to do, the caliber of his arm, and other information of similar character. We shall then be very glad to make a specific recommendation of a bullet suitable for his use.

For convenience, bullets may be divided into two classes, solid bullets or bullets cast from lead or lead alloys and those with metal jackets.

### Lead Bullets

Solid or cast bullets retain their popularity for several sound reasons. Their cost is lower than that of jacketed bullets, often only a half, third or fifth as much. For many target or small game shooting purposes no jacketed bullet suits as well. Cast bullets are as valuable in modern quick twist high power rifles as in the older slow twist, black powder arms. The accuracy attained, both in scores and in size of groups with good cast bullets in good rifles is remarkable. Until the very latest and best of high velocity jacketed bullets were developed records with cast bullets had never been excelled. "Possibles" on N. R. A. targets are always practical for good barrels at any range from 25 to 600 yards, while much finer shooting, rivaling that done with special match ammunition, is obtained when special care is taken in loading. Good cast bullets serve certain purposes better than any jacketed bullet. No shooter should be without them. They are indispensable for making up thoroughly serviceable low cost loads for any rifle or revolver.

Lead bullets are adapted for use in reduced loads in modern quick twist rifles, for loads approximating full power in older slow twist calibers (38-55, 45-70, 45-90, etc.) and for reduced or full power loads for use in revolvers and pistols. They are not adapted for full power loads in modern rifles: their unprotected base edges will be fused by the hot powder gases generated by full power loads of smokeless powder and this fusing will extend past the base and up the sides of the bullet resulting in unsymmetrical bullets which are extremely inaccurate in flight. They also have a tendency to strip because they fail to follow the rifling of the barrel when driven at high velocities. Solid bullets with plain or unprotected bases cast from a proper alloy may be driven at an initial muzzle velocity of 1400 to 1500 f. s. Their range for accuracy is not greater than 200 to 300 yards.

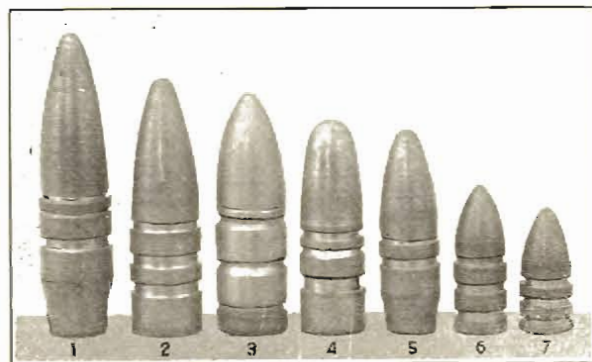
Gas check bullets are solid bullets having bases designed to accept a shallow copper cup (see page 56) which protects it from being melted or fused by the hot



powder gases generated by mid-range loads of smokeless powders. These bullets are cast from a tough alloy of lead described under "Bullet Casting". Larger charges of smokeless powder may be used with these than with the plain base types. An initial muzzle velocity of 2000 to 2200 f. s. can be imparted to them and their range for accuracy is 500 to 600 yards.

A complete list of B. & M. Cast Bullets will be found beginning on page 43.

### Target Bullets

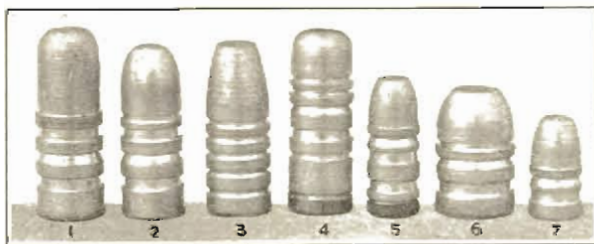


B. & M. DESIGNS OF TARGET BULLETS

- |  |                                    |
|--|------------------------------------|
| 1. B. & M. No. 311193 Boat-tail design, .30 Caliber. | 5. B. & M. No. 25990, .25 caliber. |
| 2. B. & M. No. 311179 Gehhart 30 caliber.            | 6. B. & M. No. 22960, .22-caliber. |
| 3. B. & M. No. 311169 Squibb Gas Check.              | 7. B. & M. No. 22945, .22 caliber. |
| 4. B. & M. No. 279125, .270 caliber.                 |                                    |

Generally speaking, sharp pointed bullets should be chosen for target shooting. It is claimed that these designs encounter less wind resistance than the blunt or flat nosed designs but this advantage is slight over short ranges. Some popular B. & M. designs of cast bullets for target shooting are illustrated above. The ogive or forward section of many of these bullets is so designed that, when properly seated in the cartridge case and chambered, the forward section enters the bore of the rifle, rests on the lands and is thus aligned perfectly. This feature largely accounts for the remarkable accuracy obtained with B. & M. designs.

### Game Bullets

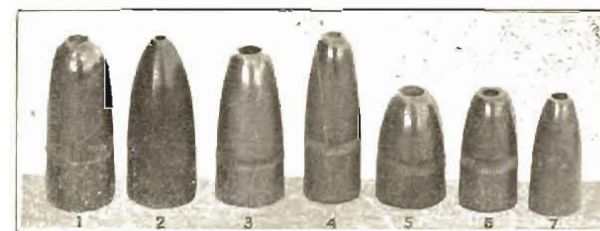


B. & M. DESIGNS OF GAME BULLETS

- |                                     |  |
|-------------------------------------|--|
| 1. B. & M. No. 359200, .35 caliber. | 4. B. & M. No. 322169, .32 caliber, Gas-check. |
| 2. B. & M. No. 311150, .30 caliber  | 5. B. & M. No. 288140, 7 mm caliber, Gas-check |
| 3. B. & M. No. 322163, .32 caliber. | 6. B. & M. No. 303183, .35-40 caliber          |
| 7. B. & M. No. 23902, .25 caliber.  |  |

At the limited velocities at which plain base lead bullets can be driven, they cannot be made to mushroom severely on game tissue. Therefore, in choosing a lead bullet for use on small or medium sized game we must place our dependence for shocking power and penetration on the weight of the bullet and the design of the point. Heavy, flat nosed bullets provide greater shocking power. B. & M. designs of game bullets range from blunt to flat points and are admirably suited for use in low power game loads. Sharp pointed bullets should not be used in game loads because of their lack of shocking power, but all of the blunt and flat nosed sporting types may be and are used extensively in target loads. Over the comparatively short ranges at which they may be used, accuracy is not measurably affected by the design of the point.

### Jacketed Bullets



1. Peters 125-gr. O. P. .30 caliber.
2. W. T. & C. W. 110-gr. O. P. .30-06 caliber.
3. Winchester 110-gr. O. P. .30-30 caliber.
4. Remington 87-gr. O. P. .25 caliber.
5. Remington 80-gr. O. P. .32-20 caliber.
6. Remington 60-gr. O. P. .25 caliber.
7. Remington 45-gr. O. P. .22 Hornet.

Progressive burning smokeless powders are capable of imparting higher velocities to projectiles than a lead bullet can withstand. Jacketed bullets consist of a lead core protected wholly or partly by a metal jacket of copper or copper alloys which is tougher and has a higher melting point than lead. This hard exterior will not strip in the rifling and is not damaged by the high pressures and hot gases generated by full power smokeless powder loads. For these reasons jacketed bullets can be driven at extremely high velocities and for long distances. The maximum velocity at which lead bullets can be driven with accuracy is 2200 f. s. while jacketed bullets are frequently driven at velocities of 3500 f. s. or more. They are of types and designs that may be used successfully in any load which the shooter desires to assemble. The accuracy attained with them is equal to that obtained with cast bullets. Jacketed bullets, as used in the U. S. A., require no lubrication and no lubricating grooves are provided. They require less care in handling than do cast bullets and ammunition is more easily assembled when they are employed.

### Target Bullets

Jacketed bullets for long range target shooting are all sharp pointed and of the full metal jacketed type. The advantage of the sharp pointed bullet becomes apparent at ranges of 1000 to 1200 yards over which many of them are used. Many of these bullets also have beveled bases, are known as the boat-tail design, and are more accurate over ranges extending 500 to 600 yards. Bullets of these designs should be used only on a target range provided with a good backstop or butt for



## B. & M. Cast Bullets

In presenting the B. & M. cast bullet designs we wish to direct your attention to their many features which make them so popular among shooters. It is possible to enter with profit into a scientific study of cast bullet designs but in our limited space here, we must confine ourselves to a discussion of shape which makes cast bullets accurate or erratic in flight, the proper location and depth of lubricating grooves, the width and number of bearing bands and other similar features.

Cast bullets are comparatively soft and are easily deformed. They should be truly in line with the bore of the fire-arm when the cartridge is chambered to prevent deformation when fired. The ogive or forward section of B. & M. cast bullets is of the correct diameter to just enter the rifling, ride on top of the lands, and center the bullet in the gun bore. Even if a B. & M. bullet cannot be seated close to the rifling, this forward section tends, after firing, to guide it and center it and accounts largely for the fine accuracy secured with cast bullets of B. & M. design.

Lubricating grooves are located so that they will always carry sufficient but not an excess of lubricant to the face of the lands of the bore as they pass. The bullet requires lubrication as it enters the rifling and grooves in the forward section are provided for this purpose. Grooves cut too deep carry an excess of lubricant. Lubricating grooves of B. & M. designs are cut deep enough to permit proper resizing and to carry the right amount of lubricant. Front bearing bands are bore diameter and are narrow. Rear bearing bands are wide and strong to withstand the pull of the rifling in rotating the bullet as its speed increases in the bore of the arm. They also have a crimping groove, properly located and beveled, into which the case lip may be crimped to hold bullets securely under sharp recoil. This groove also acts as a guide in seating bullets, an important feature in pistol and revolver ammunition.

A dirt scraper band is also incorporated in the forward section which clears out any fouling which may have accumulated—a refinement which improves accuracy.

And finally, many B. & M. cast bullet bases are slightly beveled to facilitate the seating of the bullet in the cartridge case.

B. & M. designs have been thoroughly tested by experienced shooters and incorporate all of the desirable features of the old and new record makers. As new designs are developed and thoroughly tested, they are added.

**WHEN ORDERING SAMPLE BULLETS OR BULLET MOULDS** be sure to mention by number the design desired and the make, model, and caliber of the arm in which the bullet will be used.

### ORDERING LEAD BULLETS—

For the present, we are unable to furnish cast bullets either as cast or sized and lubricated. Sample bullets only may be had.

### EXPLANATION OF BULLET NUMBERS—

The first three figures indicate the standard diameter in thousandths of an inch. The following digits indicate the approximate weight in grains. The weight, as stated in the bullet number, is the standard usually cast but owing to the variation in specific gravity of metals used in making alloys, it is not guaranteed within two to twenty grains.

**HOLLOW-POINT BULLET MOULDS** can be furnished for casting almost any of our flat nosed, 25 to 45 caliber bullet designs. The extra charge for the hollow-point feature on a B. & M. Mould is \$2.50.

**HEAVIER OR EXTRA LENGTH** bullet cavities of some of the designs shown can be cut to special order at an extra cost of \$2.50. Added length is obtained by lengthening the base band which eliminates the B. & M. beveled base feature.

### ROUND BALLS—

Owing to the reasonable price at which this type of bullet can be sold, we have not yet found it profitable to make Moulds for them. We regularly stock round lead balls in all standard sizes. Description and prices appear on page 76.

## Description of B. & M. Cast Bullets

### 22 CALIBER

Rifles chambered for the Savage caliber 22, High Power cartridges and 22-15 Stevens have groove diameters .226 inch and require bullets sized to .229 inch.

Not suited for use with 22 Hornet, 220 Swift, 218 Bee, 219 Zipper or 22-3000 Lovell arms.



No. 22945



No. 22950



No. 22955



No. 22960

No. 22945. About 45 grains weight. A sharp pointed, plain base bullet cast .231 inch for Savage 22 High Power. Length .535 inch. Recommended for light loads.

No. 22950. About 50 grains weight. A sharp pointed, gas check bullet cast to the same diameter as No. 22945. Length .605 inch. An excellent mid-range bullet.

No. 22955. About 55 grains weight. A sharp pointed, plain base bullet. Length .630 inch. Cast .231 inch. For use in low velocity loads in the 22 Savage High Power.

No. 22960. About 60 grains weight. A sharp pointed, gas check bullet. Cast .231 inch. Length .732 inch. Very accurate in both mid-range and light loads in the 22 High Power Savage.

### 25 CALIBER

Rifles for practically all 25 caliber cartridges have groove diameters of .257 inch. Bullets should be sized .259 inch. 25 Neidner, Roberts and G. & H. HP barrels often require sizing to .257 inch.

No. 25962

No. 25984

No. 25985

No. 25987

No. 25990

No. 25962. About 60 grains weight. A flat pointed, plain base bullet. Cast .261 inch. Length .497 inch. Excellent for use in small game loads.

No. 25984. About 84 grains weight. A flat pointed, gas check bullet. Length .660 inch. Excellent for mid-range small game loads. Very accurate.

No. 25985. About 85 grains weight. A flat pointed, plain base bullet. Length .660 inch. Well adapted for use in 25-20 and 250 Savage. A bullet for use in low power small game loads.



- No. 25987. An 87 grain pointed bullet. Gas check design. Length .815 inch. Very accurate.
- No. 25990. A 90 grain pointed bullet. Plain, boat-tail base. Length .873 inch. Excellent for target shooting.

### 256 NEWTON AND 6.5 MANNLICHER

The groove diameter of rifles of these calibers has not been standardized but is usually .265 inch. When ordering bullets or moulds of the designs listed below always state the groove diameter of the arm for which the bullet is intended.



No. 269120



No. 269125



No. 279111



No. 279125



No. 279136

- No. 269120. About 120 grains weight. A blunt nosed, plain base bullet especially adapted for use in the .256 Newton rifle. Length one inch. For reduced loads.
- No. 269125. About 125 grains weight. A blunt nosed, gas check bullet similar to No. 269120. Length 1.03 inch. For mid-range loads.

### 270 WINCHESTER

The groove diameter of rifles of this caliber is .278 inch. Bullets should be sized .279 to .280 inch.

- No. 279111. About 111 grains weight. A pointed, plain base bullet. Length .880 inch. For reduced loads.
- No. 279125. About 125 grains weight. A blunt nosed, plain base bullet. Length .920 inch. An excellent small game bullet.
- No. 279136. About 136 grains weight. A gas check design similar to No. 279125. Length one inch. For mid-range game loads.

### 7 mm-275 MAGNUM AND 280 ROSS

7 mm caliber rifles have a groove diameter of .285 inch, 275 Magnum rifles are .286 inch and 280 Ross rifles measure .289 inch.



No. 288138



No. 288140

- No. 288138. About 138 grains weight. A blunt nosed, slightly beveled, plain base bullet. Length .913 inch. Excellent for small game and very accurate.
- No. 288140. About 140 grains weight. Similar in design to No. 288138. Length .916 inch. Gas check base for mid range game loads.

### 30 CALIBER

Rifles chambered for the 30-30, 30 Remington, 303 Savage, 30-40 Krag, 30-1906 Springfield and others have groove diameters of .308 inch. 7.63 mm Mauser (30 Mauser) and 7.65 Luger (30 Luger) pistols measure .309 inch to .310 inch. 30 Newton rifles usually are .309 to .311 inch in the grooves.



No. 311198



No. 311115



No. 311150



No. 311165



No. 311168

- No. 311198. Weighs about 100 grains. A plain base, flat pointed bullet. Length .540 inch. Suited for use in a variety of low power, small game and short range target loads.
- No. 311115. Weighs about 115 grains. A flat nosed, gas check bullet. Length .642 inch. Suited for use in a variety of mid-range and low power small game and target loads.
- No. 311150. About 150 grains weight. A plain base, round nosed bullet. Length .865 inch. A very popular bullet, accurate and suited for use in a wide variety of low power loads.
- No. 311165. About 170 grains weight. A blunt nosed, gas check bullet. Length .906 inch. Standard bullet for 30-30 and 303 Savage game loads, the blunt point making it a good killer.
- No. 311168. This is the "Squibb-Müller" bullet. About 170 grains weight. A plain base, flat nosed bullet. Length .970 inch. The forward four bands are bore diameter, the two rear bands only fill the grooves. In match loads, bullet should be seated only over the base band. Extremely accurate. Also it is a good small game bullet.



No. 311169



No. 311170



No. 311175



No. 311190



No. 311193

- No. 311169. This is the "Squibb" bullet. Weight about 169 grains. A sharp pointed, gas check bullet. Length 1.06 inch. For short or mid-range target loads. A degree of accuracy equal to that attained with the very best of jacketed bullets may be had with this bullet.
- No. 311170. This is the "Gebhard" bullet. Weighs about 170 grains. A pointed, plain base bullet. Length 1.1 inch. Extremely accurate. A new and highly desirable bullet.



## 30 CALIBER—Continued

- No. 311175. Weighs about 180 grains. A plain base, blunt nosed bullet. Length 1.06 inch. An excellent heavy bullet for use in 30-30 and 30-06 game loads.
- No. 311190. Weighs about 190 grains. A gas check bullet similar in design to No. 311175. Length 1.13 inch. Excellent for use in 30-40 and 30-06 caliber mid-range game loads. Has two seating cannelures, one correct for each caliber.
- No. 311193. Weighs about 195 grains. A pointed, boat-tail base bullet. Length 1.28 inch. An excellent target bullet.

## 32-20, 32 COLT, 303 BRITISH, ETC. CALIBERS

Rifles and Pistols chambered for the 32-20 and 32 Colt Auto have groove diameters of .311 inch. 303 Ross Rifles usually measure .311 inch, while many 303 British rifles measure .312 to .314 inch, which is standard for the 7.62 mm Russian. The 32 S. & W. measures .313"; 32 Colt .312".

The following 30 caliber bullets which are listed above are supplied cast a full .314 inch in diameter and are adapted for use in 303 Ross, 303 British and 7.62 mm Russian Rifles.

No. 311198 as No. 31499.

No. 311170 as No. 314172.  
No. 311190 as No. 314192.

The length of these bullets is the same as the 30 caliber bullet. See listings above for description and recommendations.



No. 312100



No. 312114



No. 312115

- No. 312100. Weighs about 100 grains. A plain base, blunt nose bullet. Length .570 inch. Endorsed by experienced shooters as the best 32-20 bullet available.
- No. 312114. Weighs about 115 grains. A plain base, blunt nosed bullet. Length .625 inch. An improvement on the old standard 115 grain 32-20 bullet.
- No. 312115. Weighs about 115 grains. A blunt nosed, gas check bullet. Length .633 inch. Very desirable for mid-range loads.
- No. 312100. Weighs about 100 grains. A plain base, wad-cutter bullet for the 32-20 revolver. Length .531 inch.

## 32 REMINGTON, 32 WINCHESTER SPECIAL

## 32-40 and 8 mm Calibers.

Rifles chambered for the 32 Remington, 32 Winchester Special and 32-40 caliber cartridges have groove diameters of .319 to .321 inch. Cast bullets should be sized .322 to .323 inch. Many 8 mm rifles also have groove diameters of .320 inch. The following bullets are adapted for use in these arms.

- No. 322163. Weighs about 165 grains. A plain base, flat nosed bullet, and is the same design as the old Winchester standard. Length .750 inch. B. & M. Moulds for this design are the "point cut-off" type.
- No. 322164. Weighs about 167 grains. A plain base, blunt nosed bullet. Length .783 inch. A B. & M. improved design for 32 caliber rifles. Excellent for low power game or target loads.

## 32 REMINGTON, 32 WINCHESTER SPECIAL

## 32-40 and 8mm Calibers—Continued



No. 322163



No. 322164



No. 322169

- No. 322169. Weighs about 166 grains. A blunt nosed, gas check bullet. Length .865 inch. For mid-range game and target loads.
- No. 331188. Some 8 mm Mauser rifles found in this country have larger groove diameters than standard and cannot be fitted by the bullets listed above. This bullet is cast large enough so that it can be sized for use in such oversize bores. Weighs about 188 grains. A plain base, round nosed bullet. Length .973 inch.

## 33 AND 35 CALIBERS

Rifles chambered for the 33 Winchester cartridge have groove diameters of .338 inch.

Remington 35, Winchester 35 and 35 Magnum rifles have groove diameters of .356 to .358 inch. The 35 Newton measures .359 inch.



No. 340190



No. 359200



No. 359220



No. 359266

- No. 340190. Weighs about 190 grains. A plain base, flat nosed bullet. Length .920 inch. This is an extremely accurate bullet for all around use in the 33 Winchester. B. & M. Moulds furnished to cast this design are the "point cut-off" type.
- No. 359200. Weighs about 210 grains. A plain base, blunt nosed bullet. Length .855 inch. Excellent for light loads in the 35 caliber rifle.
- No. 359220. Weighs about 225 grains. A blunt nosed, gas check bullet. Length .91 inch. For light and mid-range loads in all 35 caliber rifles and for loads approximating full power in 35 Remington and Winchester.
- No. 359266. Weighs about 270 grains. A blunt nosed, gas check bullet. Length 1.10 inch. An excellent bullet for 35 caliber sporting ammunition.

## 38 CALIBER REVOLVER BULLETS

The Colt 38 caliber Revolvers have groove diameters of .354 inch, except the .38 Colt Auto which measures .356 inch. S. & W. 38 Special Arms measure .357



inch. The 9 mm Luger usually is found to be .358 inch. When ordering any of the 38 caliber bullets listed below, always state the make and model of the arm for which they are intended or advise us groove diameter of the barrel.



No. 359130



No. 359146



No. 359160



No. 359165

No. 359130. About 130 grains weight. A plain base, wad-cutter bullet. Length .50 inch. A short range target bullet. Very accurate.

No. 359146. About 146 grains weight. A round nosed, plain base bullet. Length .61 inch. This is the standard 38 S. & W. and Colt bullet.

No. 359160. Weighs about 157 grains. A round nosed, plain base bullet. Length .64 inch. This is the standard 38 special bullet.

No. 359125. Weighs about 124 grains, a round nose plain base bullet not illustrated.

No. 359106. Weighs about 105 grains, same design as No. 359160 but shorter.

No. 359165. Weighs about 150 grains. A plain base, wad-cutter bullet. Length .595 inch. This type of bullet is steadily increasing in popularity. They cut clean holes in targets and impart maximum shocking power.



#### 38-55, 38-56 WINCHESTER CALIBERS

Rifles chambered for the 38-55 and 38-56 have groove diameters of .379 inch.

No. 381275. Weighs about 275 grains. A plain base, flat pointed bullet. Length 1.03 inch. Suited for full power loads in 38-55 and 38-56 rifles.



#### 38-40 CALIBER

Rifles and revolvers chambered for the 38-40 cartridges have groove diameters of .400 to .401 inch. Groove diameters of the various old Winchester 40 caliber rifles are usually .403 to .406 inch.

No. 403185. Weighs about 185 grains. A flat pointed, plain base bullet. Excellent game and target bullet.



#### 405 WINCHESTER CALIBER

Rifles chambered for the 405 Winchester cartridges have groove diameters of .412 inch.

No. 414300. About 300 grains weight. A flat pointed, plain base bullet. Length .940 inch. Standard bullet for 405 Winchester.

#### 44 CALIBER

Most arms chambered for 44 caliber cartridges have groove diameters of .427 to .429 inch although the older Models of Colt arms measured .424 inch. 44 Winchester (44-40) rifles measure .4285 inch. When ordering bullets for use in 44

caliber arms, or moulds for casting them, always state the groove diameter of the arm in which the bullet will be used. A soft lead slug which has been pushed through the bore, carefully packed and forwarded with your order, will assist us in determining the correct size to furnish



No. 425205



No. 429205



No. 429200



No. 429240



No. 429260

No. 425205. Weighs about 200 grains. A flat pointed, plain base bullet. Length .590 inch. For 44-40 caliber rifles and revolvers having groove diameters of .424 inch.

No. 429205. Weighs about 210 grains. A flat pointed, plain base bullet. Length .590 inch. For 44 caliber arms having the standard groove diameter of .427 to .429 inch.

No. 429200. Weighs about 195 grains. A plain base, wad-cutter bullet. Length .53 inch. Extremely accurate in the 44 Special.

No. 429240. Weighs about 235 grains. A round nosed, plain base bullet. Standard for 44 Special. Length .684 inch.

No. 429260. Weighs about 225 grains. A plain based, wad-cutter bullet. Very popular and extremely accurate.

No. 429261. Weighs about 262 grains. A plain based, blunt nosed bullet. This is an extra heavy bullet for the 44 caliber.

No. 432215. Weighs about 210 grains. A plain based, flat pointed bullet. Length .632 inch.

No. 429220. Weighs about 220 grains. A flat pointed bullet. Length .640 inch.

#### 45 COLT AND 45 A. C. P. CALIBERS

Arms chambered for the 45 Colt have groove diameters of .452 inch. The 45 A. C. P. measures .451 inch. Cast bullets should be sized one to two thousandths oversize.



No. 454210



No. 454250



No. 452236



No. 454260

No. 454210. Weighs about 200 grains. A round nosed, plain base bullet. Length .55 inch. An excellent short range bullet.

No. 453200. Weighs about 160 grains. A plain based, wad-cutter bullet. A wad-cutter for short range target shooting. Length .437 inch.

No. 452195. Weighs about 195 grains. A blunt nosed, plain based bullet for the 45 A. C. P. Length .573 inch.

No. 454250. Weighs about 240 grains. Standard, round nosed, plain based bullet. Length .456 inch.



45 COLT AND 45 A. C. P. CALIBERS—*Continued*

- No. 452236. Weighs about 230 grains. A pointed, plain based bullet. Functions perfectly in the 45 Automatic pistol. Fine for N. R. A. Match preparation practice. Length .703 inch.
- No. 454235. Same as above but made with double in place of single lubrication groove.
- No. 454260. Weighs about 255 grains. Extreme weight and a very blunt nose gives the maximum shocking power obtainable in the 45 Colt cartridge. When crimped in beveled groove, shell holds 40 grains FFg Black Powder for which it is designed. Length .670 inch.

## 45-70 AND 45-90 CALIBERS

Rifles chambered for these cartridges have groove diameters of .457 inch.



No. 458237

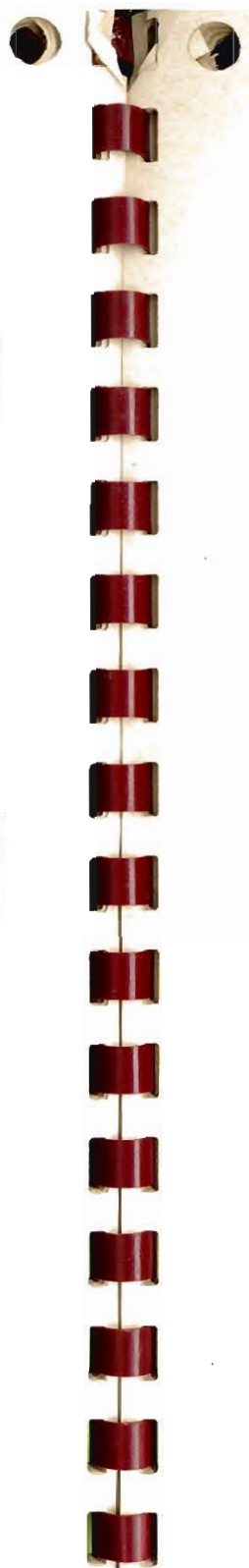


No. 458346



No. 458400

- No. 458237. Weighs about 240 grains. A plain based, blunt nosed bullet for short range loads in 45-70 and 45-90 rifles. Length .590 inch.
- No. 458346. Weighs about 345 grains. A plain based bullet. Length .885 inch. Shown as hollow point. May be had in either hollow point or solid design. There is an extra charge of \$2.50 for hollow point type B. & M. Bullet Mold. (See page 42.) An excellent game bullet.
- No. 458400. Weighs about 400 grains. A blunt nosed, plain base bullet. Length .940 inch. For full power loads in 45-70 and 45-90.





## B. & M. Fine Bullet Moulds



B. & M. Bullet Mould

line with the handles (not to a side), and have ample length for easiest striking. Sprew holes have edges beveled thin. They actually cut the sprew from bullets instead of breaking or tearing it off. Dull edged sprew cutters often leave a ragged crater in the bullet base which always decreases the accuracy of the bullet's flight.

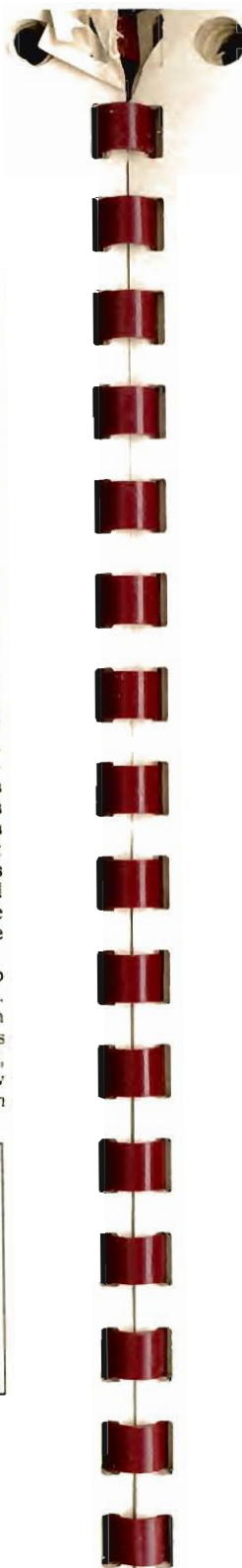
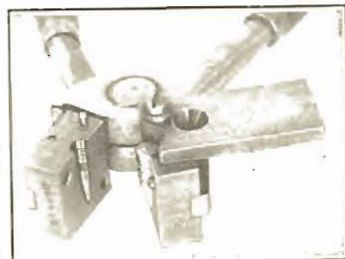
These Moulds are new. They embody, we believe, the best features of all previous American Moulds. Their popularity among experienced reloaders can be accepted as indicating their efficiency and high quality. They are the product of a precision factory. Bullets for which these fine Bullet Moulds are cut are nearly all newly designed, and are not hold-overs from black powder days. Among them are included the new and old record makers of all popular calibers. Each bullet design incorporates all ballistic requirements and is indorsed by prominent shooters everywhere. The "Cast Bullet" section of this catalogue contains a list and description of the B. & M. line of cast bullets for which B. & M. Moulds may be obtained.

B. & M. Bullet Moulds are not wastefully large or elaborate, nor are they made light and small to meet a price limit. They will cast bullets easily, perfectly, and speedily,—the bullets demanded by the modern shooter for modern guns.

The large blocks, with good thickness of metal at every side of the bullet cavity, are important in securing uniformly full bullets. The blocks hold an even casting temperature at base, sides, and point of the bullet cavity. These big blocks are swiveled so that they swing backward and forward a little on the handles, which allows the large close-fitting dowel pins on the faces of the blocks to guide them into perfect alignment. Thus the blocks are self aligning. They come together with the utmost precision, whether cool or hot, and they maintain this true fit under long and continued hard service. Old fashioned Moulds with blocks and handles of one piece nearly always warp out of true alignment after a little use.

The cut-off plates are heavy and are designed to cut, and not tear, the sprew from the bases of bullets. Upon their convenient size and shape depends speed in casting, and upon their alignment and cutting depends greatly the bullets accuracy. B. & M. cut-off plates, being made of broad heavy pieces of steel are real sprew cutters. They project well beyond the mould blocks, in

B. & M. Bullet Mould Showing Jaws Open



The cut-off plate hinge is large and strong and contains a new spring locking feature which always keeps the plate swinging freely and prevents it from getting tight or loose.

Bullet cavities are cut by experts which is a job that can be well done only after extended experience. From these carefully cut moulds bullets drop out easily. They are furnished in single and double cavity designs.

The handle hinge is well made, extra large, close fitting and smooth working under all conditions. It is relieved inside and provision is made for heat resisting graphite lubrication as needed.

Mould handles stand well out one from another, giving much greater ease in grasping and turning the mould. The heavy wood covered shanks are long enough, without seeming clumsy, to remain cool after prolonged casting. They meet the practical shooter's ideals.

Finally, every Mould is checked and tested by actual bullet casting before it is sent out, thus insuring that it be correct in every detail when received.

Bullet Moulds make shooters much less dependent on ammunition factories and help advance the limit of enjoyment and practice that is imposed by the high cost of commercial ammunition. Even if a rifle or revolver owner buys most of his bullets for handloading, he should have Moulds for use in emergencies when the factory bullets are not available. The Moulds will prove a channel of much pleasure and interesting experimentation.

The Police Departments of every town and city should own Bullet Moulds and Reloading Tools. Members of the Force, in spare time, can load thousands of rounds of ammunition for practice shooting—so vital in building up effectiveness.

These Moulds, properly used as described under "Bullet Casting", cast as perfect lead bullets as can be obtained. They will continue this satisfactory service indefinitely and save their cost in a surprisingly short time. We recommend B. & M. Bullet Moulds unqualifiedly.

Shipping weight, 2 pounds 8 ounces.

## Venting Moulds

The character and finish on the inside of our Mould Blocks preclude the need for venting block faces in most instances. Occasionally, however Moulds require venting. We do this venting during our test casting but sometimes an unvented Mould, that gives perfect results in our hands, develops a crankiness in a customer's hands due to peculiarities of temperature and metal used by him. Such trouble is met more often in bullets with many bands than in the more simple types.

Anyone can vent a Mould. It is done with a small three cornered file. A very shallow score is cut in the face of the block leading into the groove which does not cast fully and sharply. The score must be of a mere hair's depth as it reaches the bullet cavity, but should be deeper at the outer edge. Never vent a Mould unless it becomes absolutely necessary for, unless done carefully, there may be a slight burr along the edges of the score which will prevent the blocks closing properly. Few Moulds require venting when bullet metal is properly alloyed of fine materials and the temperatures of bullet metal and mould are correct.

## Bullet Moulds for Special Bullet Designs

We frequently receive requests from our shooting friends to make up Moulds for bullets of their own design for which there may be little call or from those who may want a Mould for an obsolete bullet of some design not in our regular lists. To manufacture a Mould it is necessary to make a "cherry", a tool shaped exactly like the bullet, with cutting edges to cut the bullet cavity in the Mould block. It is our policy to accommodate shooters in all reasonable demands and we will make these special "cherries" for our customers for \$15.00 each. After the necessary cutting tool is made, the Mould is manufactured and sells at the regular price. In filling such requests, we require a blue-print of the bullet, showing all detail, exact diameters, length, number of grooves, etc. These cherries cannot be altered after having been hardened.



## Bullet Casting

### Bullet Metals

A Bullet Mould, a Melting Pot, Mallet and a Dipper with nozzle are the tools necessary for bullet casting. A gas stove or small electric furnace serve excellently for heating bullet metal because the temperature can be regulated exactly. A gasoline camp stove is almost as good and a kitchen stove with a coal fire is not far behind.

For the convenience of shooters we furnish Bullet Metals of the proper alloy in three different tempers, serving your needs for every cast bullet requirement. Pure lead is soft and is used only for making bullets for old models of rifles. Lead 20 parts and block tin one part makes a useful alloy for use in all rifles having a twist longer than fourteen inches, except where velocity is very high. Tin makes lead flow better and toughens the bullet. The above alloy is slightly softer than B. & M. No. 1 Bullet Metal.

Lead 10 parts and tin one part makes an alloy perhaps the best for the majority of bullets. It is tough enough to withstand the quick twist, even at midrange velocities of modern rifles, and is not very expensive. It is easy to mix and cast and is also fine for gas check bullets. This mixture is not quite as hard as B. & M. Bullet Metal No. 2.

Lead 85 parts, block tin  $7\frac{1}{2}$  parts and metallic antimony  $7\frac{1}{2}$  parts makes a hard tough alloy with a relatively high melting point that may be used satisfactorily for all bullets—especially for plain base bullets to be driven at muzzle velocities of 1300 to 1500 f. s. from quick twist modern rifles and for all gas check bullets. The antimony enables it to resist the heat of heavier charges of smokeless powders. Bullets cast from this metal are not often marred or dented in handling. This mixture is approximately that of B. & M. Bullet Metal, No. 3.

Lead 8 parts, block tin one part and antimony one part is a very hard alloy preferred by some shooters for gas check, heavy plain base and revolver bullets. It is considerably lighter than lead and is somewhat brittle.

When extreme accuracy is desired from cast bullets, some experimenting is usually necessary to learn the exact alloy that best suits a particular barrel. When block tin is not procurable, use half and half solder which is composed of half tin and half pure lead. Tin, in excess of about 11%, contained in a liquid mixture of tin and lead will crystallize when the alloy solidifies. Therefore, no good purpose is served when more than the usual 10 parts of tin generally specified in bullet metals is added.

If metal is to be prepared by the shooter, we advise that pure lead be obtained and that he avoid such materials as lead pipe, linotype metal, battery plates, etc. The usual practice of a shooter is to use up all of the scrap lead available but, if you desire bullets of known hardness, purchase pure materials for making up bullet metals. Materials such as those mentioned above are usually alloyed with antimony, tin, etc., in unknown quantities, which makes difficult the control of the temper of the resulting metal.

### Alloying Bullet Metal

Determine first the amount of bullet metal to be made up. Weigh out the required amounts of metals to be used to obtain the desired temper. Melt the lead first and cover it with powdered charcoal and thereafter keep the surface covered. Cut your materials into small pieces as it will be found that the metals will melt faster. After the lead has been melted, drop in the required amount of tin which will melt at once. If an antimony alloy is to be prepared bring the lead and tin mixture to a temperature that will char a piece of wood, but not red hot. Add the antimony in small chunks. It has a higher melting point than lead and may require some time to melt. Antimony does not mix readily with this alloy and the mixture must be stirred frequently. As dross accumulates on the surface avoid skimming it as much as possible but, rather, flux it by dropping in a small piece of grease,

such as bullet lubricant. Keep the temperature down as low as possible, barely melting the antimony, and dross will be minimized. Allow the alloy to cool to a proper casting temperature before beginning bullet casting and do not permit it to stand in melted state long without stirring since the metals have a tendency to separate—the antimony being the lightest tends to rise to the top. Materials for manufacturing bullet metal may be purchased from B. & M. or from nearly all hardware or plumbing shops.

### Casting Bullets

In casting bullets, clean your bullet mould, if of iron, by washing with gasoline or immersing in boiling water for several minutes. Merely wiping out the grease is not sufficient. Much time will be lost and many imperfect bullets will be cast if the mould is cleaned by casting. Next heat the mould by standing it on a hot griddle, holding it near a gas flame with blocks tightly closed, or, as many prefer by proceeding with the bullet casting. When the latter method is used the imperfect bullets cast while the mould is being heated should be returned to the pot and re-melted. If the metal is sufficiently hot five or six bullets should bring the mould to the proper casting temperature. Never immerse the Mould in the bullet metal. The test of correct casting temperature for both alloy and mould is this: pour a bullet leaving a puddle of metal on the cut-off plate—this puddle should require about two seconds to "set" after the dipper nozzle leaves it. Keep the mould and metal at this temperature throughout casting.

B. & M. Bullet Moulds are heat treated to break them in and they should cast perfect bullets as soon as they are clean and hot enough. When ready to cast, hold the mould with the pouring hole at the side, not on top, and lift a dipper of metal from the bottom of the pot. Spill a little through the nozzle into the melting pot, then press the nozzle into the pouring hole of the mould and, while holding the dipper and mould as one, moving slowly, turn them together to an upright position. The weight of the metal left in the dipper above should assure full, sharp and smooth bullets in the mould below without spilling a drop of metal. Bear in mind that the mould and metal must be hot enough, so that the bullets stay fluid all the time the nozzle is connected and for two seconds afterward.

Use a B. & M. Rubber Mallet to knock the cut-off plate around, never a metal hammer. Catch the bullets on soft cloth and never allow them to strike each other or any hard surface because they are easily dented or marred when hot. A little practice will enable you to make perfect bullets swiftly.

Should a bullet refuse to fall out of a mould when opened, spread the halves apart and tap with a rubber mallet on the outside of the flat forward end of the plier handle. If metal tends to stick to the cut-off plate or to the nozzle of the dipper, apply a little tallow or beeswax now and then. Never attempt to pry out a sticking bullet and never touch the faces of mould blocks with any metal. The slightest burr on the surface of these blocks will cause trouble. Keep the hinges of the mould lubricated with graphite. When through casting, leave a bullet in the mould blocks, allow to cool, then grease the mould with pure grease. Oil is not sufficient to prevent rust for a period of months at a time.

### B. & M. Ladles for Casting Bullets



Ladles for casting Bullets are a necessity if excellent results are to be achieved. B. & M. Ladles are fitted with pipe snouts designed to fit the opening of B. & M. Bullet Moulds. Ladles prevent spilling the metal. All reloaders who cast their own bullets should own one.

Shipping weight, 8 ounces.



## B. & M. Melting Pots

In casting bullets it is necessary to have a body of metal, weighing at least ten pounds, from which to dip. B. & M. Melting Pots are furnished in two sizes. The small size holds from ten to fifteen pounds of bullet metal, sufficiently large for the average individual handloader. The larger size, holding from 25 to 30 lbs., is recommended for use when casting a large number of bullets. B. & M. Melting Pots are cast from iron and are perfectly suited for this use.

Shipping weight, large size, 6 lbs., 8 ozs., small size, 3 lbs., 10 ozs

## B. & M. Rubber Mallets

A hardwood, lead alloy or rubber mallet should be a part of every reloader's equipment. They should be used when casting bullets and when seating bullets with the B. & M. Model 26 Bullet Seater, and are useful for other purposes. B. & M. furnish a good hard rubber mallet ideally suited to the needs of the handloader.

Shipping weight, 1 pound 10 ounces

## B. & M. Gas Check Cups

B. & M. Gas Check Cups are made from copper and are to be used on the bases of cast bullets designed to receive them. They permit the use of heavier charges of powder, thus increasing the velocity, range and killing power of lead bullets. It has been determined that bullets cast from an alloy consisting of one part tin to ten parts lead or any other suitable alloy of this hardness will not strip or skip over the rifling, using any reasonable mid-range load in our modern quick twist rifle barrels.



But mid-range loads of smokeless powder will fuse the unprotected bases of lead bullets. Fusing destroys the accuracy of any load because it deforms the all important bullet base and has also a tendency to extend up the sides of the bullet in streaks allowing gases to rush by. These streaks up the sides of bullets unbalance them and cause them to take what is commonly known as a "corkscrew" flight, ruinous to accuracy. To overcome this difficulty, a shallow cup or gas check is affixed to the bullet base. Energy sufficient to secure excellent accuracy at ranges of 600 yards may then be imparted to the bullet, without danger of fusing or deforming their bases or sides.

While Gas Checks were developed primarily for use in loads for ranges of 500 to 600 yards, they have been found to improve the accuracy

of short range loads, due to the fact that the gas check cup provides a base which is smoother and truer than that of the average plain base cast bullet. Loads employing gas check bullets have been used with excellent results on small game and vermin, such as woodchucks and coyotes, and with a great saving in cost over the regular jacketed bullets normally used. For mid-range target shooting with lead bullets they are indispensable.

Gas Checks should be affixed to the bases of bullets before sizing and lubricating. Attaching is a simple operation. The Gas Checks may be spread out, face up, on a table top, the base of the bullet placed in one of the gas checks and pressed into place.

B. & M. Gas Checks are available in any caliber up to and including 35 caliber. They are manufactured from a specially selected sheet copper of the temper and thickness which shooting authorities have determined as best for each caliber. Shooters will find them uniform in diameter and weight, and desirable in depth and form. The care used in their manufacture results in increased shooting accuracy.

Shipping weight per thousand, 13 ounces

## Sizing and Lubricating Cast Bullets

### Sizing

Barrels for firearms are first rough bored, then reamed to a polished or smooth bore and afterward chambered and rifled. The tools used in these operations are subject to wear and, if barrels for firearms are to be produced by machinery at an economical cost, it is not possible to replace these tools at the instant any wear becomes apparent. Thus, manufacturers allow certain tolerances in the groove diameters, bore diameters, and chamber depths and diameters of arms of the same caliber. In the manufacture of ammunition this variation must be taken into consideration and the factory loaded cartridge must fit the smallest chamber and bore likely to occur, with the result that accuracy obtained is not comparable with the highest degree attainable when handloaders assemble ammunition exactly fitted to their arms.

One of the most important factors in obtaining superior accuracy with cast lead bullets is the proper fit of the bullet in the barrel of your arm. The first step in obtaining this proper fit is to ascertain the "groove diameter" of your barrel. The depressions between the raised twist or "lands" of the rifling of a barrel are the grooves. The "groove diameter" is, therefore, the diameter of a barrel measured from the bottoms of opposite grooves. In the old days lead bullets were used slightly smaller than the bore of the arm. This practice enabled shooters to charge easily muzzle loading arms and often permitted the use of a cloth cleaning patch over the bullet. Charges of black powder then used were depended upon to "upset" the bullet sufficiently to make it fit the bore snugly and provide a seal against the escape of powder gases. But today, with few exceptions, lead bullets are sized one to three thousandths of an inch larger than the groove diameter of the arm. On page 86 is a table giving the groove diameters of various caliber arms and the tolerances allowed by the manufacturers. Many handloaders are satisfied to use this table as a guide in determining the diameter of the bullet to be used.

Those who desire to know the exact groove diameter of their particular arm should proceed in the following manner. Remove the bolt or breech block and slightly oil the inside of the barrel. Secure a soft lead slug which is slightly oversize for the barrel and start it from the muzzle using a hardwood punch. When started it can easily be forced entirely through the barrel with the aid of a cleaning rod fitted with a square end tip like the B. & M. Push Tip. When the slug approaches within an inch or two of the breech, arrange to have it drop on some soft material or recover it with your hand to avoid deforming it in any manner. With the aid of a micrometer, the exact groove diameter of the barrel may be obtained by measuring the distance between opposite raised sections of the slug. The bore diameter is the distance between opposite depressed sections of the slug. Barrels having a quick twist may require the slug to be driven through. A hardwood or rubber mallet may be employed. In this operation, as in starting the slug, care should be exercised not to damage the bore.

"Star-gauged" barrels are those in which these measurements have been taken at one inch intervals for the entire length of the barrel. Tight or loose places in your rifle barrel may be noted by the resistance which the lead slug offers in its course through the bore. These variations usually do not materially affect accuracy unless they occur close to the breech or muzzle of the barrel.

All B. & M. factory cast bullets and all bullets cast with B. & M. Moulds are, as described under "Cast Bullets", from five to six thousandths of an inch oversize. This oversize tolerance is provided so that the reloader can, by resizing, cut down the diameter of these bullets to meet exactly his requirements. Most authorities agree that bullets resized one, two or three thousandths larger than the groove diameter of an arm are the most satisfactory. The beginner should use slightly oversize bullets.

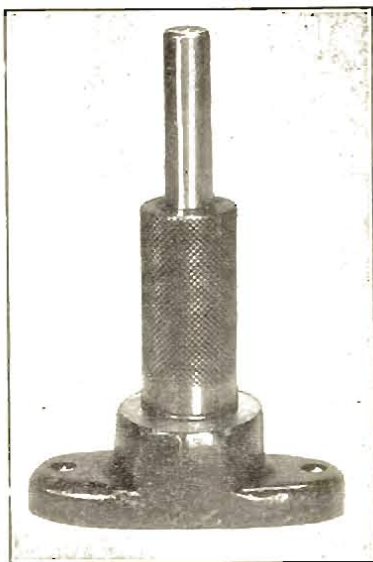


## The Bullet Sizer

### Operation

The B. & M. Bullet Sizer is designed to be attached to a work bench having a hole bored underneath to allow the resized bullets to drop through into a padded box or on a blanket. It is an exceptionally accurate straightline tool consisting of four parts—the Base Casting, Guide Sleeve, Driving Plunger and Sizing Die. These are furnished for all standard calibers and resize bullets to the standard diameters stated in the descriptions of each (see "Cast Bullets" page 43). These

standard resized diameters will, in most cases, be from one to three thousandths larger than the groove diameter of your arm and thus conform to the accepted over-size qualifications for cast bullets. Special sizes for barrels slightly over or under size may be had at a small additional cost. Resizing Dies are made from tool steel and have exceptionally long life. The Guide Sleeve or upper part of the tool is bored the size of the cast bullet. In operation, if gas checks are used they should be attached before the resizing operation is begun. (See page 56). The bullet is started base first in the Guide Sleeve and is forced down and through the die. This operation sizes the bullet exactly.



The B. & M. Bullet Sizer

Resizing Dies and Guide Sleeves of the B. & M. Bullet Sizers are all interchangeable and, thus, but one base casting is required for any number of calibers. Driving Plungers are concaved to fit the nose of the bullet to be resized, to prevent deforming it in any manner. When ordering, the type of bullet to be used should be mentioned, although plungers shaped for use with pointed or spitzer type bullets can usually be successfully used with blunt nosed bullets.

Shipping weight 1 pound, 13 ounces.

B. & M. Bullet Sizers may be adapted to any caliber.

Prices of additional parts are as follows:

Plungers.....

Guide Sleeves.....

Sizing Dies.....

For prices see our regular Price List.

B. & M. Bullet Sizers may be adapted for use to full length resize 45 A. C. P. caliber cartridge cases by the purchase of a Guide Sleeve, Driving Plunger and a specially hardened Die.

30 caliber Bullet Sizers may be adapted for swaging 32-20 caliber jacketed bullets (.312") to the correct size for use in 30 caliber rifles, (.308") by the purchase of a special hardened Die.

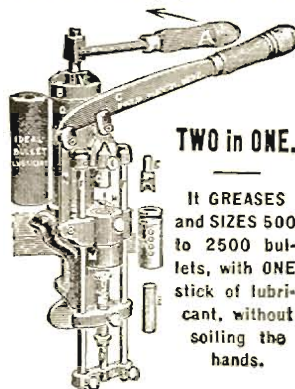
Prices of additional parts for either of these operations are as follows:—

Extra Plungers.....  
Extra Guide Sleeves.....  
Extra Dies (hardened).....

For prices see our regular Price List.

## Ideal Bullet Lubricator and Sizer No. 45

The Ideal Bullet Lubricator and Sizer, No. 1, lubricates and sizes bullets and affixes metal gas check cups (if required) in one operation. It does the work quickly, easily, cleanly and accurately and leaves the bullets perfectly true and clean. It will pay for itself in time saved, if one makes bullets in any quantity. It has been in use for many years and has always given complete satisfaction.



**TWO in ONE.**

It GREASES and SIZES 500 to 2500 bullets, with ONE stick of lubricant, without soiling the hands.

The machine should be ordered with Die "H" of the size which it is desired to size the bullets. Other Dies "H" may also be ordered of any size, so that the machine will size any bullet desired. Punch "G" should be ordered to fit the point of the particular bullet which it is desired to resize, giving the number of the bullet although, usually, if the punch "G" is ordered for a "Spitzer" or sharp pointed bullet, it will work satisfactorily with other types of bullets of that caliber without deforming the point. To prepare the machine for lubricating a certain bullet, screw "K" is adjusted so that the bullet will enter Die "H" only to the depth required for all of the grooves to be filled with the lubricant, but the bullet must not enter so deeply that one of the holes in Die "H" will come above the bearing of the bullet and allow lubricant to escape over the point of the bullet. The Handle "A" is rotated so as to bring pressure on the lubricant and cause it to extrude through the holes in Die "H" into the grooves of the bullet. A cast bullet is placed, base down, on punch "I" operating inside of Die "H", the handle "C" is brought down forcing the bullet into Die "H" the required depth, when the lubricant, under pressure flows into the grooves filling them completely. The handle "C" is then raised, bringing the bullet out of the die completely, accurately sized and lubricated. From time to time, turn handle "A" a little so as to keep continual pressure in chamber "O".

B. & M. Bullet Lubricant may be purchased in hollow sticks easily inserted in chamber "O" by removing handle "A" and unscrewing nut "B". When it is desired to lubricate gas check bullets in the Ideal Lubricator and Sizer a special inside punch "I" with the end concaved to fit the gas check should be ordered. This prevents the lubricant from flowing over the slightly convex base of the gas check and crowding itself between the base of the bullet and punch "I".

We recommend this machine to those handloaders who contemplate resizing and lubricating a large number of cast bullets.

We regularly carry the tool in stock as well as additional dies for adapting it for additional calibers.

Shipping weight 4 pounds.



## Lubrication of Bullets

### MATERIALS REQUIRED

1 Cake Cutter 1 Pan B. & M. Bullet Lubricant



B. & M. Cake Cutter

For lubricating bullets, no way has been designed as good as melting the lubricant and dipping the bullet base into it. B. & M. Bullet Lubricant contains no substance that will settle to the bottom when it is melted. It is therefore entirely practical to stand the resized bullets on their bases in a pan provided for the purpose and pour the melted lubricant into the pan until it reaches the uppermost groove in the bullet. After the bullet lubricant has hardened, a B. & M. Cake Cutter is used to remove the bullets by passing the Cake Cutter over them. These Tools are furnished in bullet diameter. The mouth is forced over the bullet, shaving the lubricant clean along its sides, which operation results in a perfectly lubricated bullet. The B. & M. Cake Cutter is open at the top permitting the bullets to be expelled as the operation is continued. Bullet Lubricant should be wiped from the bases of bullets before loading.

B. & M. Bullet Lubricant may be purchased in pans or in sticks sized to fit Ideal or Bond Sizing and Lubricating machines.

B. & M. Cake Cutter, shipping weight 8 ounces.

B. & M. Bullet Lubricant, shipping weight, per pound, 1 pound 8 ounces.

B. & M. Straightline Bullet Sizer, Cake Cutter, Pan and  $\frac{1}{2}$  pound Lubricant, shipping weight 3 pounds.

## Table of Jacketed Bullets, Primers and New Empty Primed Cartridge Cases.

## Jacketed Bullets, Primers and New Empty Primed Cartridge Cases

We carry a complete stock of jacketed bullets, primers and new empty primed cartridge cases. These ammunition components are of Remington, Winchester, Western and Peters manufacture. We try at all times to have all brands on our shelves for prompt shipment, but in the event that we are sold out of any item, delay in shipping will only be until the arrival of our new factory shipment. Often a delay of this nature will be avoided if the shooter will state a choice of brands with which the order may be filled. Primers and primed cases cannot be mailed but may be shipped either by Express or Freight. Bullets and unprimed cartridge cases may be forwarded via parcel post. If you do not find the item listed here which you desire, write us. We can usually supply any cartridge component of U. S. A. manufacture. Order primers by brand and number, stating whether for rifle or revolver cartridges and avoid all possibility of error. Abbreviations used to indicate the style of bullets listed below are as follows: OP—Open Point, Hollow Point or Mushroom; SP—Soft Point; FJ—Full Metal Jacket; Bt—Boat-tail; MP—Metal Patched; BP—Bronze Point (Rem); HCP—Hollow Copper Point (Win); PP—Protected Point (Peters); CL—OP, Corelokt Open Point (Rem); CL—SP, Corelokt Soft Point (Rem); IB—OP, Inner Belted Open Point (Peters); IB—SP, Inner Belted Soft Point (Peters); ST—Silver Tip (Western and Win); PE—Pointed Expanding (Win). See price list enclosed for latest prices.

NAME AND CALIBER	PRIMER			BULLET	
	Win.	Rem.	West.	Style of	Weight Grs.
218 Bee.....	116	61 $\frac{1}{2}$	61 $\frac{1}{2}$	OP	46
219 Zipper.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	OP	56
22 Hornet.....	116	61 $\frac{1}{2}$	61 $\frac{1}{2}$	OP, SP	45
				OP	46
220 Swift.....	120	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP	48
22 Sav. E.-power.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP, CL-SP	70
25 Automatic (6.35 m/m).....	108	11 $\frac{1}{2}$	11 $\frac{1}{2}$	FJ	50
25-20 Win.....	116	61 $\frac{1}{2}$	61 $\frac{1}{2}$	Lead	86
				MP, SP	86
				OP	60
25 Remington.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP, CL-SP	117
25-35 Winchester.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	FJ, SP, CL-SP	117
250 Savage.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	OP, CL-SP, CL-OP	100
				SP, PTD, SP	87
257 Roberts.....	120	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP, CL-SP	117
				OP, CL-OP	100
270 Winchester.....	120	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP, CL-SP	150
				OP, CL-OP	130
				SP	100
7 m/m Mauser.....	120	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP	175
7.62 m/m Russian.....	120	91 $\frac{1}{2}$	81 $\frac{1}{2}$	HCP, BP	143
30 Mauser (7.63 m/m).....	108	11 $\frac{1}{2}$	11 $\frac{1}{2}$	MP	86
30 Luger (7.65 m/m).....	108	11 $\frac{1}{2}$	11 $\frac{1}{2}$	MP	93
30-30 Winchester.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	FJ, SP, CL-OP	
				CL-SP	170
				OP, CL-SP	150
30 Remington.....	115	91 $\frac{1}{2}$	81 $\frac{1}{2}$	SP, CL-OP, CL-SP	170
				FJ	160



# JACKETED BULLETS, PRIMERS AND NEW EMPTY PRIMED CARTRIDGE CASES—Continued

NAME AND CALIBER	PRIMER			BULLET	Weight Grs.
	Win.	Rem.	West.		
30-06 Springfield.....	120	9½	8½	SP, CL-OP, CL-SP	220
				SP, OP, FJ-Bt	180
				CL-OP, CL-SP	150
				FJ-Bt Match	150
				OP, BP, FJ	110
				OP	220
30-40 Krag.....	115	9½	8½	CL-OP, CL-SP	180
				OP, SP	220
				CL-OP, CL-SP	180
300 H & H Magnum.....	120	9½	8½	CL-OP	180
				FJ-Bt Match	180
300 Savage.....	115	9½	8½	SP, CL-SP, CL-OP	180
				OP, CL-SP, BP	150
303 Savage.....	115	9½	8½	SP	190
				CL-SP, CL-OP	180
303 British.....	115	9½	8½	SP	215
32 Winchester Spl.....	115	9½	8½	OP	165
				SP, CL-SP, CL-OP	170
32 Automatic (7.65 m/m).....	108	1½	1½	MC	71
32 S & W.....	108	1½	1½	Lead	85
				Lead	88
32 S & W Long.....	108	1½	1½	Lead	98
				WC	98
32 Short Colt.....	108	1½	1½	Lead	80
32 Long Colt.....	108	1½	1½	Lead	82
32 Colt New Police.....	108	1½	1½	Lead	98
				Lead	100
32 Winchester Self-Loading.....	116	6½	6½	SP	165
32 Remington.....	115	9½	8½	SP, CL-SP, CL-OP	170
32-20 Winchester Revolver.....	108	1½	1½	Lead	100
				FJ, SP	100
				OP	80
32-20 Winchester Rifle.....	116	6½	6½	Lead	100
				FJ-SP	100
				OP	80
32-40 Winchester.....	115	9½	8½	SP	165
33 Winchester.....	120	9½	8½	SP	200
8 m/m Mann Schoenauer.....	115	9½	8½	SP	200
8 m/m Lebel.....	120	9½	8½	SP	170
8 m/m (7.9 m/m) Mauser.....	120	9½	8½	SP	170
348 Winchester.....	120	9½	8½	CL-OP, CL-SP, SP	200
				SP	150
35 Winchester.....	120	9½	8½	SP	250
35 Winchester Self-Loading.....	116	6½	6½	SP	180
35 Remington.....	115	9½	8½	OP, SP, FJ,	200
				CL-OP, CL-SP	
351 Win. Self-Loading.....	116	6½	6½	FJ-SP	180
357 Magnum.....	108	1½	1½	Lead	158
375 H & H Magnum.....	120	9½	8½	FJ	300
				SP	270

# JACKETED BULLETS, PRIMERS AND NEW EMPTY PRIMED CARTRIDGE CASES—Continued

9 m/m Luger.....	108	1½	1½	FJ	115
				FJ	124
38 Smith & Wesson.....	108	1½	1½	Lead	145
				Lead	200
38 Special.....	108	1½	1½	WC	148
				Lead, WC	158
				MP	158
				Lead	200
38 Short Colt.....	108	1½	1½	Lead	130
				Lead	125
38 Long Colt.....	108	1½	1½	Lead	150
38 Colt New Police.....	108	1½	1½	Lead	150
38 Automatic.....	108	1½	1½	FJ	130
380 Automatic.....	108	1½	1½	FJ	95
38-40 Winchester.....	111	2½	7	SP	180
38-55 Winchester.....	115	9½	8½	SP	255
401 Win. Self-Loading.....	115	9½	8½	SP	200
405 Winchester.....	120	9½	8½	SP	300
41 Long Colt.....	108	1½	1½	Lead	200
				Lead	195
44 S & W Russian.....	111	2½	7	Lead	246
44 S & W Special.....	111	2½	7	Lead	246
44-40 Winchester.....	111	2½	7	SP	200
45 Colt.....	111	2½	7	Lead	255
				Lead	250
45 ACP & Auto Rim.....	111	2½	7	MC	230
				Lead	230
45-70 Government.....	120	9½	8½	SP	405

\*Frankford Arsenal Cases take an F.A. Primer, caliber .45.

There are many other makes of bullets available to handloaders such as those made by Sisk, Barnes, Speer, Sierra, Modern Gun Shop (MGS) etc., some of which are listed in our current Price List. See our Price List for full information and prices on these brands.



"Make This Nation Again  
A Nation of Riflemen"



Join The  
National Rifle Association  
1600 Rhode Island Ave.  
WASHINGTON, D. C.

The United States  
Revolver Association  
5 Oak Street  
SPRINGFIELD, MASS.

## Reloading Shotgun Shells

While no appreciable amount can be saved by handloading shotgun ammunition many do so to obtain special or experimental loads and for the pleasure they derive from handloading. For the convenience of these shooters, we furnish Reloading Tools for shotgun cartridges and carry a reasonably large stock of cartridge components. Since the demand for these items is limited and the variety available so large, we do not always have on hand for immediate shipment, all of the items that may be desired. In such cases, we will secure these from the manufacturers promptly so that no great delay will be experienced by the purchaser. Orders for empty shotgun shells must state the gauge, make and length desired. Submit the base of a fired cartridge case with orders for primers since information concerning the brand and gauge is not always sufficient.

Handload new shells or preserve carefully for reloading those fired only in your own gun. Carefully guard against moisture, which will swell the shells too large to go back into the gun, and protect the shell muzzle on which you must depend for an adequate crimp.

### Directions

Seat primers flush or to the bottom of primer pockets. Use the metal tube to keep shells from swelling and seat wads with a uniform pressure. Leave enough shell lip for an adequate crimp. In the crimper, feed the shell slowly and turn the handle rapidly.

### New, Improved LYMAN *Ideal* Shotshell Reloading Tools

#### Ideal Straightline Re and De-Capper

Seats primers to uniform depth no matter what length, or size of shotshell. Especially designed to re and de-cap all shells for 12 to 20 gauge.



IDEAL STRAIGHTLINE RE- AND DE-CAPPER

A compact convenient and highly satisfactory tool for loading shotshells made in 12, 16 and 20 gauges only. Used on a table or bench and may be fastened down if desired. Suitable for use with either new or fired paper shells.

#### Straightline Hand Loader



IDEAL STRAIGHTLINE HAND LOADER

#### Ideal Straightline Crimper

The Straightline Crimper is operated by hand. Return the original crimp on the "New Crimp" shells with a simple "straight" pressure of the arm. Gives firm and accurate crimp. Available for 12, 16 and 20 gauges.



IDEAL STRAIGHTLINE CRIMPER

#### Ideal Star Crimper

Operates by hand or by power but is not recommended for continuous power drive. Works in a straight line and turns a perfect round crimp. Furnished with solid steel crimping heads. Available in 12, 16 and 20 gauges. One Grip will handle all size shells.



IDEAL STAR CRIMPER



## Loading Suggestions

For the best results, we urge the beginner to use only Bulk Smokeless Shotgun Powder and in moderate standard loads. It is of prime importance to use balanced loads, both for good even patterns and safety.

Table of Shotgun Loads

Gauge	Shot (Ounces)	DuPont Bulk Smokeless or Black (Bulk Meas.)	DuPont MX (grains)	Herc. Red Dot (grains)	DuPont Oval (grains)	Herc. Herco (grains)
10	1 1/4	3 1/2 drams	29	28		
	1 1/4	4 1/4 drams	36	34		
	1 3/8				46.5	
	1 1/2					50
	1 5/8					45
12	1 to 1 1/4	3 drams	25.5	24		
	1 to 1 1/4	3 1/4 drams		26		
	1 to 1 1/4	3 1/2 drams		28		
	1 to 1 1/4				40	40
	1 3/8					37
16	7/8 to 1	2 1/2 drams	21.5	20		
	7/8 to 1	2 3/4 drams		22		
	1				34.5	37
20	3/4 to 7/8	2 1/4 drams	18.5	18		
	3/4 to 7/8	2 1/2 drams		20		
	7/8				25.5	32.5
	1				25.5	28.5
28	5/8		16	16	21.0	
	3/4					21
410	5/8			7	9.4	10

Next in importance to balanced powder charges and shot loads is the use of an adequate and uniform crimp. Shell ends must be in good condition. Give light loads a heavy or hard crimp to increase resistance and use a lighter crimp on heavy loads.

Seating wads correctly has a direct influence on the shooting performance of your load. Seat them flat and in turn apply the pressure to each wad except the shot wad, which is controlled by the crimp. Usually one cardboard wad is used directly over the powder charge, followed by one 1/4 inch Black-edge Felt Wad when using Bulk Smokeless or Black Powder, or, by two 1/4 inch Black-edge Wads or a 1/4 inch and one 3/8 inch Black-edge Wad when dense Smokeless is used. The idea of the wadding is to secure compression resistance and to fill the shell so as to leave a lip of 1/4 inch for crimping after the top wad is in place over the shot load.

These simple instructions plus care and some judgment will get the beginner as far as pages of elaborate advice.

## B. & M. Stainless Steel Cleaning Rods

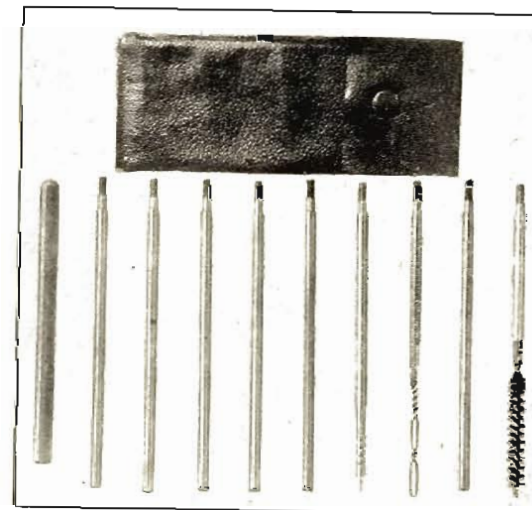
The theory that a Cleaning Rod should be made of a soft material has been disproved. There are many sound reasons why soft rods are unsatisfactory.

The surface of a soft rod is somewhat porous and irregular. These minute holes and irregularities catch, hold, and, when the rod is used, carry dirt and dust into the polished bore of the Arm. Some of this dirt is highly abrasive in character and will grind the steel of your barrel as efficiently as so much powdered emery.

Soft rods are easily bent by a light lateral strain and when once bent, even slightly, do not spring back to their original straightness. A bent rod is difficult to handle and, since it is bound to rub the bore excessively when used, is the cause of a great deal of unnecessary barrel wear.

Brass and wood rods are attacked by many of the modern cleaning solutions and hence are unfit for use when these preparations are employed.

Corrosion and rust attack brass, iron, and steel cleaning implements and roughen and mar their surfaces. A rusted or corroded rod, when rubbed against the bore, acts exactly like a file and with the same effect.



B. & M. Cleaning Rod Type "C" Showing all available Tips.

The screw joints of a rod are its weakest points. Brass, iron and soft steel rods easily bend and frequently break at the joints. There are few who have used this type of rod who have not bent and broken several.

Inferior, inadequate, and harmful cleaning will result, despite your best efforts, when poor cleaning tools are used. Poor cleaning implements damage the bore and preclude the use of many effective and essential cleaning chemicals.

Poor tips will not hold patches securely and are not designed to push the patch snugly against the lands and into the grooves. Swivels are frequently placed near the tip, in which position few of them work even reasonably well.



We might continue to expand the discussion of the disadvantages of poor cleaning tools but we know it is unnecessary, for no shooter can afford to take the chance of destroying the fine accuracy of his arm through the use of improper cleaning implements. The small, additional initial cost of a high class cleaning rod is an investment which will greatly aid in prolonging the accuracy life of your arm and will, for a lifetime, return dividends in safety and satisfaction.

## Advantage of Stainless Steel for Cleaning Rods

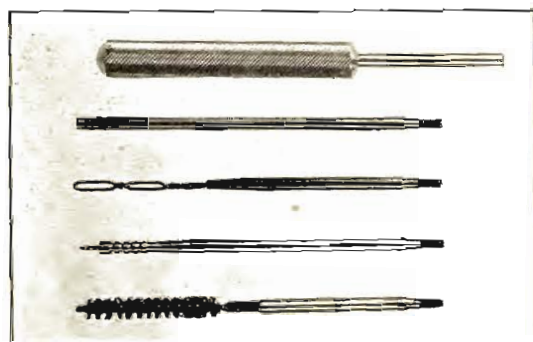
Stainless Steel will not rust or corrode.

Stainless Steel used in B. & M. Rods and Tips has a hard, highly polished, close-grained surface which will not carry and hold abrasive dirt and grit.

Stainless Steel will withstand the chemical action of all proper cleaning solutions, including ammonia preparations.

Stainless Steel Rods are stiff, straight, and strong. If bent they will spring back to their original position.

Stainless Steel Rods will withstand use and abuse which would ruin rods made of other materials.



B. & M. Cleaning Rod Type "A" Showing all available Tips.

## Mechanical Features of B. & M. Rods

**THE HANDLES**—All Handles are made of steel, knurled, and are indestructible. They are  $5\frac{1}{2}$  inches long and of two diameters. The large diameter,  $\frac{5}{8}$  inch, is standard and used on all rods except the Type "C", the handles of which are  $\frac{3}{8}$  inch in diameter.

**THE SWIVEL**—An exceptionally easy running smooth swivel is incorporated in the large B. & M. Handle. All side strain is relieved by a  $2\frac{1}{2}$  inch section of the Rod within the Handle forming a bearing below the swivel. The end thrust is carried by a cone bearing and the counter end thrust by a substantial pin. This design provides exceptional strength and reliability. B. & M. Swivel Handles allow the patch to follow the twist of the rifling. You can see the Rod turning and are assured that the patch is running truly with the grooves and cleaning them properly.

**THE JOINTS**—A double dowel design is used. The connecting threads carry only the thrust. The side strain is carried on long, neat fitting dowel shoulders. This construction provides exceptional firmness and strength. B. & M. sectioned joints are remarkably true and have no tendency to become loose and wobble. Any wear is taken up automatically. The joints stay well locked in use, yet are

easily unscrewed. All sections of a rod and the tips screw together properly and hence are interchangeable.

## B. & M. Tips

B. & M. Tips must be used before a shooter can really appreciate their excellence. They consist of a Mull Tip, Double Slotted Tip, Push Tip and Brass Brush and Adaptor. B. & M. Stainless Steel Rods are furnished standard with a Mull Tip and Brass Brush and Adaptor. The Double Slotted Tip may be had in place of the Mull Tip if so desired. Push Tips are extra.



Mull Tips may be had in all Calibers. 1. 22-caliber. 2. 25-caliber. 3. 270-caliber. 4. 30-caliber. 5. 35-caliber. 6. 38-caliber. 7. 40-caliber. 8. 44-caliber. 9. 45-caliber.

**THE MULL CENTERING TIP** is acclaimed by shooters as the finest on the market. Its design is clearly portrayed in the above picture. The pin on the end of the Tip is passed through the center of the patch and holds the patch on the Tip as the Rod is passed through the action and accurately centers the patch in the bore of the rifle. The diameters of the forward knob and the succeeding bands are such that a standard patch is held against the lands with just enough pressure to insure proper cleaning. The bands on the Mull Tips hold the patch securely on the Tip during the forward and rearward stroke and press it in five continuous circles against the bore. The loosened fouling is collected by those sections of the patch which lie between the bands. The Mull Tip insures easier, better, and safer cleaning. Unless otherwise advised, the Mull Tip is furnished as standard equipment with all B. & M. Cleaning Rods.

**B. & M. DOUBLE SLOTTED TIPS** are made of strong, smooth surfaced, steel wire. Shooters who prefer slotted tips for cleaning will find this Tip superior to the ordinary single slotted type. The two slots of the B. & M. Tip are at right angles with each other. When a patch is inserted in each slot or a longer thinner patch threaded through both slots the Tip is held safely away from the bore and thorough cleaning is insured. The Slotted Tip is also especially useful when the bore is to be coated with heavy oil or grease. It can be had in place of the Mull Tip or ordered as an extra.

**THE BLANK PUSH TIP** is used to force lead slugs through the bore, to assist in removing cartridge cases which do not extract easily, or to remove any obstruction in the chamber or bore of the firearm. Available as extra equipment.

**BRASS, STEEL, and BRISTLE BRUSHES** have long been recognized as a necessary part of any cleaning outfit. They are usefully employed in the removal of tight fouling, metal fouling, etc., when ordinary cleaning methods fail.

A Brass Brush and Adaptor is furnished as standard equipment with all B. & M. Cleaning Rods.



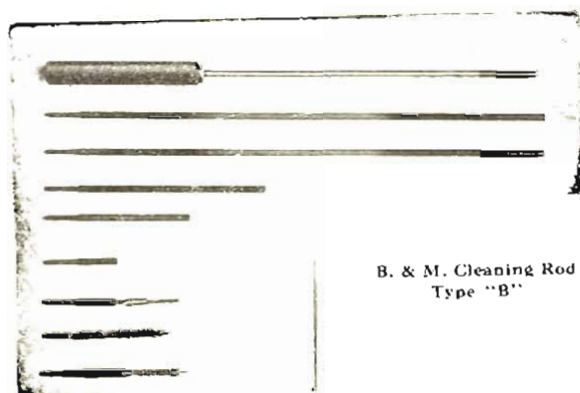
## B. & M. Cleaning Rods

B. & M. Stainless Steel Rods are manufactured in two diameters—.203 inch for 25 and smaller caliber arms and .250 inch diameter for larger caliber arms. The standard length is 36 inches but they can be had in other lengths at a slight additional charge. These Rods are manufactured in four types designed to meet all needs of the shooter. They are furnished in all calibers. When ordering, please state caliber desired. All Rods are complete with a set of Tips as described on preceding page.

### Type "A" Cleaning Rod

This is a one-piece Rod, 36 inches in length, designed primarily for home use. Every shooter should own a one piece Cleaning Rod. Complete with set of Tips as described on preceding page.

Shipping weight 1 lb. 14 ounces.



B. & M. Cleaning Rod  
Type "B"

### Type "B" Cleaning Rod

This type is a three-piece jointed Rod consisting of two 12" and one 6" sections. Complete with set of Tips, as described on preceding page, all in a convenient leatherette carrying case.

Shipping weight 1 pound.

### Type "C" Cleaning Rod

This type "C" Cleaning Rod consists of six 6" sections and a small rigid  $\frac{3}{8}$ " handle which is threaded to the Rod when assembled. It is designed for lightness and portability and can easily be carried in the pocket. Complete with set of Tips as described on preceding page, in a convenient leatherette case.

Shipping weight 1 pound.

## Revolver and Pistol Rods

The Pistol or Revolver Rod consists of a small Type C Handle, 8" Section and a set of Tips as described on page 69, all in a convenient zipper leatherette case.

Shipping weight 1 pound.

B. & M. Stainless Steel Cleaning Rods may be adapted to larger calibers than the one for which they were originally purchased by obtaining an Adaptor and extra Tips of the proper caliber. Adaptors may be had for Parker as well as other brushes.

For prices, see our regular Price List.

Shipping Weight of each of the above Tips 8 ounces.

## Stop Collar



B. & M.  
Stop Collar

THE B. & M. STOP COLLAR is designed to be attached to a Cleaning Rod to limit the forward cleaning stroke, so that the patch will not emerge from the bore of the arm and drop off or, due to only a slight protrusion, become wedged in the bore causing delay and loss of patience. It is manufactured from steel and is indestructible. An easy twist of the thumb and finger anchors the collar securely to the Rod at any desired point without marring its highly polished surface. Its use makes cleaning speedier, safer, and more satisfactory. B. & M. Stop Collars are made to fit standard Cleaning Rods of our own and other makers. When ordering state the diameter of your Rod. Shipping Weight 8 ounces.

## Shotgun Cleaning Outfits



Any B. & M. Cleaning Rod can be fitted with a special Adaptor to take the parts illustrated herewith. They consist of one swab, wire brush and patch holder. When ordering always state gauge desired.

## Cleaning Patches

B. & M. Cleaning Patches are cut from medium weight cotton flannel, well washed and are the correct size to use with B. & M. Cleaning Rod Tips. Patches



for the various calibers when used with the correct caliber tip properly fit the bore. B. & M. Cleaning Patches are furnished in packages containing one ounce and are cut to the following sizes.

22 caliber— $1\frac{1}{8}$ " square.

25 caliber— $1\frac{1}{4}$ " square.

30 caliber— $1\frac{3}{8}$ " square.

Patches for larger calibers are the same size as 30 caliber. They are supplied at a reasonable price.

## Brass Brushes

Brass Brushes are useful from time to time to loosen tight fouling, remove rust, metal fouling, etc., from the bore of the firearm. B. & M. carry a complete stock of these implements in all calibers. The use of brass or steel brushes in firearm bores should be avoided except when necessary.

## Gun Oil Powder Solvent

Gun Oil Powder Solvent, popularly known as G. O. P. S., is a preparation manufactured exclusively by B. & M. for the shooter. After the bore of the firearm has been thoroughly cleaned and dried, a patch saturated with G. O. P. S. should be passed through it several times. This preparation clings to the barrel steel, penetrates the pores and protects it against corrosion. Arms not in constant use should have a patch saturated by G. O. P. S. passed through their bores frequently—especially during damp weather. This preparation is a highly developed product and is recommended unreservedly.

Shipping Weight	1-6 Pint Oiler	8 ounces
	Pint Can	1 pound 8 ounces

## The Proper Cleaning of Firearms

If the accuracy life of the barrels of our modern firearms is to be preserved, good cleaning outfits and intelligent care will be required. While there are several contributory causes leading to the eventual destruction of the accuracy life of firearm barrels, corrosion is foremost. Other causes, some preventable or partly so, include erosion of the bore by hot powder gases, excessive use of jacketed bullets and poor cleaning outfits.

Wiping the bore of a firearm after firing, even if a good cleaning solution is used, is not a positive guarantee that corrosion may not set in at a later date. Some of the products of the combustion of both primer and powder have been driven into the pores of the barrel steel and cannot be entirely removed by any preliminary cleaning operation. This condition is evidenced by the browned or blackened interior of the bore of any firearm which has been used to any extent. These products of combustion, if allowed to remain in the bore may attract moisture or "sweat". The bore of any arm in this condition is subject to corrosion.

The harmful products which remain after the piece has been fired are soluble in water and water is employed in modern cleaning methods to dissolve and wash them away. Preliminary cleaning should consist of a thorough swabbing of the bore, using patches saturated with warm water or better still, immerse the muzzle in warm water and pass a wet patch through the bore from the breech. The backward stroke of the patch then pumps the water into the bore, making the washing away simple indeed. This procedure should be followed by drying the bore thoroughly by the use of dry patches after which the bore should be coated with a good gun oil such as G. O. P. S. The bore should be carefully examined from time to time and additional patches saturated by a good powder solvent passed through it. Arms

to be stored should be cleaned as above and then coated with grease. Coating the bore with grease should not immediately follow preliminary cleaning since the bore may corrode beneath the grease.

## Lead Fouling

Leading of the bore of firearms in good condition is not often encountered when properly loaded ammunition is used. Revolvers usually cause the most trouble and often much experimentation is required before a remedy for the trouble is found.

A rough or rust pitted bore will lead for obvious reasons. There is no remedy except to re-barrel the arm if lead alloy bullets are to be used.

Proper bullet lubrication is important. A proper lubricant, such as supplied by B. & M., should be used. Bullet Mould cavities must be large enough to cast bullets, which after resizing, retain lubrication grooves deep enough to carry sufficient lubricant. Cast bullets not lubricated sufficiently or which carry no lubricant will lead the bore excessively.

Cast bullets driven at velocities greater than those recommended under "Cast Bullets", page 37, may strip and fail to rotate properly causing lead to be deposited in the bore.

Cartridge cases should be crimped evenly on lead bullets, and no more than is necessary to hold the bullet stationary under recoil or against magazine springs. Cases unevenly and severely crimped tend upon discharge to strip pieces from the sides of lead bullets which leads to inaccuracy and leading.

Wear may cause improper alignment of the revolver cylinder with the bore. A bullet passing from an improperly aligned cylinder strikes the bore off center and is deformed. Leading is a frequent result of this condition.

Bullets cast from too soft an alloy may expand when passing from the cylinder of a revolver or through the throat of a rifle and become over-size for the bore. Bullets, especially for use in revolvers, should be cast hard enough to withstand this "jump". In rifle ammunition the bullet can usually be seated so that when the cartridge is chambered, the bullet will nearly touch the lands, thus reducing the "free jump" to a minimum. Since the bullet begins to rotate only after it is in connection with the lands of the barrel, it is evident that the more rapid the forward motion of the bullet at the instant it hits the lands, the more difficult it is for the lands to impart rotary motion to it without excessive stripping. The tendency to strip is present in all arms and, when excessive, results in leading. The remedies are:—reduce the "free jump" of the bullet to a minimum, cast the bullet from the hardest alloy practicable or reduce the powder charge.

Firing rapidly may heat the barrel and cause leading.

Lead fouling can usually be removed by the use of a good brass brush. "Blue Ointment" obtainable in any drug store can also be used. The bore of the barrel is coated with this ointment and then vigorously wiped. It does not harm steel and can be allowed to remain in the barrel indefinitely.

## Metal Fouling

Modern jacketed bullets have aided materially in making metal fouling of rifle barrels less common. Cupro Nickel jacketed and especially some lots of service bullets made hurriedly during the World War offend in this respect. Roughened bores will metal foul even when the bullet and other cartridge components are correct. In most instances, it will be found possible to remove these lumps or patches by scrubbing with a good brass brush and especially will this be found to be true if the process of metal fouling has not been permitted to progress to a very great extent or the cleaning not delayed too long. Barrels which have a tendency to metal foul should be watched closely and cleaned frequently.



When it is impossible to remove cupro-nickel metal fouling by the use of a good brass brush the following formula will be found very effective. This solution can be made up by any druggist and should be ordered in small quantities as required, since it quickly loses its strength.

Ammonia Persulphate.....	100 grains
Ammonia Carbonate.....	50 grains
Strong Ammonia (26%).....	1½ ounces
Water.....	½ ounce

The solution should be kept in a tightly corked bottle. No portion of it may be used more than twice. The used portion must not be mixed with the unused solution but should be bottled separately. It should be used within 30 days from the time mixed and should not be used in a warm barrel.

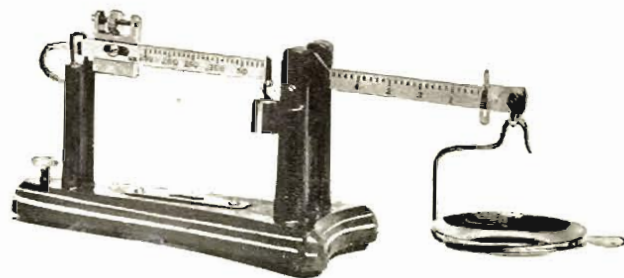
To remove metal fouling from a barrel, plug the breech with a rubber stopper and fit a short piece of rubber tube over the muzzle. Fill the bore through this tube with the solution and let stand not more than 20 minutes. This solution will be a deep indigo blue when it is poured out and the treatment should be repeated as long as the spent solution shows this color.

This ammonia solution has no appreciable action on steel when not exposed to the air but, if allowed to evaporate on steel, will attack it rapidly. The barrel therefore must be thoroughly washed with water and dried as soon as the solution is poured out or it will be spoiled with rust. Care should be exercised to avoid spilling the solution in the receiver. After the treatment, the bore should be coated with a smokeless powder solvent and gun oil—such as G. O. P. S.

## Shooters' Accessories

### Scales

Although Scales are not necessarily a part of a reloader's equipment when the B. & M. Visible Powder Measure is used, shooters frequently desire to verify the weight of each charge when making up loads developing maximum pressures and velocities. Scales are useful in verifying slide settings of powder loaders, in experimental loading, weighing bullets, etc. See section "Checking the Slide Settings of the B. & M. Visible Powder Measure" page 33. Shooters frequently hand-weigh charges desired for target loads when extreme accuracy is sought. We furnish three types of Scales, both admirably suited for the purposes enumerated above.



Fairbanks No. 3054 Scale

This is a Fairbanks Scale, No. 3054. Its capacity is 250 grains and is sensitive to 1/10 of a grain. It is very accurate, quick to come to rest, rugged, and durable.

Scales furnished by B. & M. are especially graduated in 1/10th grains on outside bar and in 5 grain units on inside bar.

Shipping weight 4 pounds

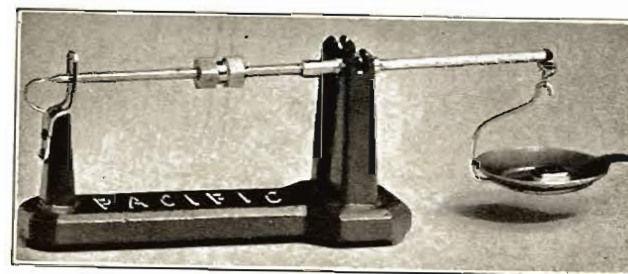


### Troemner Balance

This is a Troemner Prescription Balance. Its capacity is ½ ounce and is sensitive to ¼ grain. A set of weights (two drachms to ½ grain) is included. Extra sets of weights may be purchased. This Scale is sufficiently accurate for the average user. It is an unusually good scale for the price.

Shipping weight 3 pounds

### Pacific Powder and Bullet Scale



This is the Pacific Scale. It is an extremely accurate scale and is reasonably priced. Sensitive to 1/10th of a grain. A set of weights consists of four 1/10 grain weights, one each ½, 1, 2, 3, 4, 5, and 6, and two 20-grain weights. With this combination, you can accurately weigh by one tenth grains, any powder charge desirable. Capacity 242 grains.

Shipping weight 3 pounds.



## Union Hardware and Osborne Wad-Cutters

(For cutting Shotgun, Rifle and Revolver wads)

These round drive punches are forged from the best grade of tool steel, carefully hardened and tempered. The holes taper back from the cutting edge so that the wads clear freely, and only a light blow is required with a mallet to cut with ease. Union Hardware Wad-cutters are furnished in gauges only; Osborne Wad-cutters may be had in practically any size for rifle and revolver calibers.



Osborne Wad-cutter

Union Hardware Wad-cutter

### Union Hardware Wad-Cutter

10 to 28 gauge.....See current Price List

### Osborne Wad-cutter

22 to 25 caliber.....

27 to 32 caliber.....

38 to 40 or .410 caliber.....

44 to 45 caliber.....

Shipping weight 8 ounces.

For prices see our  
regular Price List.

## Round Lead Balls and Buckshot

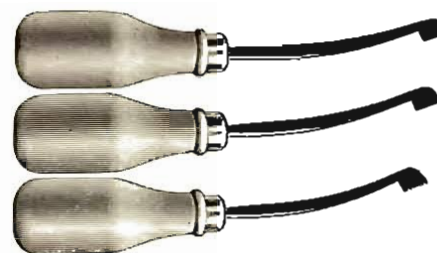
We regularly stock the following sizes of Buck Shot and Lead Balls. Lead Balls, when used in rifles, should be slightly larger than groove diameter. Buck Shot should always be chambered in the Muzzle of a choke bore shotgun.

Number (Eastern)	Diameter	Number to the pound
4C	.24"	341
3C	.25"	299
2C	.27"	238
1C	.30"	175
0	.32"	144
00	.34"	122
000	.36"	103
	.38"	85
	.40"	70
	.42"	64
	.43"	55
	.44"	50
	.48"	45
	.50"	40
	.53"	32
	.58"	24
	.64"	18
	.68"	14

Price: See current Price List.

## GUN CHECKERING TOOLS — \$2.75 postpaid

For Set of 3 Tools  
16 Line—\$2.75  
18 or 20 Line—\$3.50



The illustration shows the Checkering Tools  $\frac{1}{2}$  of actual size. These are identical to those used in some of the New England gun factories. The No. 1 tool is a double line spacer (checkering). The No. 2 is a double line Bordering Tool and No. 3 is a single line rasp or Cleaning Tool. They are all finish hand filed. The metal is not hard so that they can easily be kept sharp with a file.

Price per set of three, 16 lines to the inch, is \$2.75, postpaid. Anything other than standard size such as 18 or 20 line is \$3.50 per set. Swiss Pattern files, 3 square, for sharpening No. 1 Tool 45c each. Round Files for the No. 2 Tool 45c each. Bent 3-square Rifflers—\$1.50 each.

"Send me another set of Checkering Tools. Once before I had a set of these and did better with them than with any of the rest."—C. A. P., Alaska.

## B. & M. Gun Rests



Gun Rests used on the range permit shooters to rest the rifle while spotting and while resting between shots. B. & M. Gun Rests are cast from aluminum and weigh but four ounces. The stem is six inches long and the crotch padded.

B. & M. Gun Rest, wide type, for Remington Model 37 and Winchester Model 52 fitted with Marksman stock. Shipping weight 8 ounces.

## Jostam New Monte Carlo Cheek Pads



These Pads are made of fine leather and are designed to be laced on any stock. They raise the comb of any stock and particularly adapt low combed stocks for comfortable use when telescope sight equipment is installed. They are furnished in three heights,  $\frac{1}{8}$ ",  $\frac{1}{4}$ " and  $\frac{1}{2}$ " inch. Shipping weight 8 ounces.



## We carry in stock the Samworth Books on Firearms

An extensive series of authoritative and practical works gotten up and published by men with a lifetime of experience in the use of firearms. These are not copies of manufacturer's catalogs or other previously published material. Each is a highly original and specialized treatise relating solely to its particular subject. We can unhesitatingly recommend each and every one of them.

English Pistols and Revolvers, George, 256 pages, 26 plates. A historical work for firearms student or collector. . . . . \$4.00

Textbook of Firearms Identification, Hatcher, 900 pages. The outstanding and accepted authority on legal ballistics. . . . . \$7.50

Book of the Springfield, Crossman, 450 pages. Tells everything about the .30'06 and its ammunition. . . . . \$4.00

Military and Sporting Rifle Shooting, Crossman, 500 pages. Devoted solely to the proper use of modern rifles. . . . . \$4.50

Twenty-two Caliber Varmint Rifles, Landis, 521 pages. On the increasingly popular 22 caliber "wildcats". . . . . \$5.00

Textbook of Pistols and Revolvers, Hatcher, 532 pages. The most complete book ever written for handgun users. . . . . \$4.25

Modern American Pistols and Revolvers, Gould. . . \$3.50

Modern American Rifles, Gould. . . . . \$3.50

The above two volumes deal with firearms of the 19th century but will be found very interesting reading for present day shooters.

A Rifleman Went to War, McBride, 400 pages. Actual experiences of a skilled American rifleman in war. . . . . \$3.50

Shots Fired In Anger, George, 418 pages. The experiences of a rifleman in World War II. . . . \$4.00

Modern Gunsmithing, Baker, 525 pages. A classic —and the most practical, useable work offered. . \$4.50



Big Game Rifles and Cartridges, Keith, 170 pages. An amazingly complete and practical volume. It's tops! . . . . . \$2.00

Big Game Hunting and Marksmanship, Lee, 200 pages. . . . . \$2.00

Handloader's Manual, Naramore, 375 pages. This is the outstandingly original work for the handloader. It is a complete and safe guide for the beginner to follow. Crammed full of new data on cartridge assembly and interior ballistics—equally applicable for the skilled shooter. We cannot recommend it too highly. . . . . \$3.50

Telescopic Rifle Sights, Whelen, 197 pages. A necessity for every scope purchaser or user. . . . \$2.00

Automatic Pistol Marksmanship, Reichenbach, 140 pages. Restricted to automatic pistols and practical shooting. . . . . \$1.50

Sixgun Cartridges and Loads, Keith, 155 pages. Highly recommended for the revolver handloader and user. . . . . \$1.50

Sixguns and Bullseyes, Reichenbach, 151 pages. The standard for the skilled revolver shot. . . . \$1.50

Firearm Blueing and Browning, Angier, 152 pages. Complete and usable formulae for amateur or professional. . . . . \$2.50

Elementary Gunsmithing, Frazer, 210 pages. A complete and practical textbook for the beginner. . \$2.00

Professional Gunsmithing, Walter Howe, 520 pages. For the amateur and professional gunsmith. . . . \$6.00

Advanced Gunsmithing, Vickery, 432 pages. Devoted to the metal-working phases of gunsmithing. . . . . \$4.00

Firearms Design and Assembly, Alvin Linden  
No. 1—Inletting the Gun Stock. . . . . \$2.10  
No. 2—Shaping the Inletted Blank. . . . . \$2.10  
No. 4—Finishing the Gunstock. . . . . \$2.10





## B. & M. Steel Butt Plates (Shotgun Type)

Blued finish, cross grooved,  $5\frac{1}{8}$  inch length and  $1\frac{1}{2}$  inch width only.

Plain style, not fitted to rifle..... \$2.00  
Oval Trap Style, not fitted..... 3.50



Shipping weight 8 ounces.

## B. & M. Bluing Solution

This is the same solution which is used by us to blue our own products. 4 ounce rubber stoppered bottle—more than enough for one gun barrel, \$1.00. Full instructions for use accompany each bottle.

Shipping weight 10 ounces.

## Recoil Pads for Rifles and Shotguns

Recoil Pads take the "kick" out of shooting high power rifle and modern high velocity shotgun loads. We regularly stock rubber cushion pads of "Jostam" make designed for screw attachment. They are furnished in three sizes: large, medium and small. Nearest size may be readily trimmed to fit any butt stock. Kindly give butt stock size when ordering.

Shipping weight 8 ounces.

## Slip Over Leather Boots

Akron Model, rubber base, designed to be laced on any stock.

Shipping weight 8 ounces

## Gun Slings

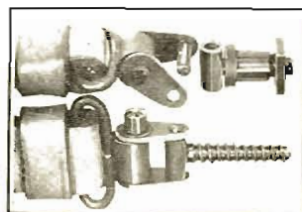
$\frac{7}{8}$  and  $1\frac{1}{4}$  inch Whelen Type Leather Slings

These Slings are manufactured from exceptionally good quality leather and are guaranteed to last a lifetime

Shipping weight 8 ounces

## Quick Release Swivels

These Swivels are instantly detachable by means of snaps and are noiseless when used with the correct width of anti-rattle Screw Eyes. They are designed for use with the  $\frac{7}{8}$  and  $1\frac{1}{4}$  in. Whelen Sling listed above. Can be adapted to practically all rifles.



Shipping weight 8 ounces.

## Table of Average Ballistics of Rifle and Revolver Cartridges

The following table represents standard velocity, energy and trajectory figures as adopted by the Sporting Arms and Ammunition Manufacturers Institute, June 24, 1938.

Muzzle Velocity, sometimes referred to as Initial Velocity, is the velocity of the bullet at the muzzle of the gun. The rate of travel is given here in feet per second (f.s.), the distance which the bullet would travel in one second if its velocity were constant. The unit of measurement of Energy is the foot-pound, which is equal to the work required to lift a pound weight one foot. Shooters should note that the energy, expressed in foot pounds possessed by a bullet, is not a good index to its shocking power. The design of the bullet and the nature of the wound it inflicts largely govern this feature. A full jacketed bullet will normally pass through the body of a game animal and in so doing only expends a portion of its energy. An expanding bullet which is brought to a stop in the body of game imparts all of its remaining energy to it and therefore has greater shocking power.

Trajectory is defined as the curve described by the axis of a bullet in flight. The trajectory figures given below indicate the height at mid-range of this curve in inches above the horizontal plane from gun muzzle to point of impact. For example the trajectory figure at 200 yards of the 30-06 Springfield cartridge, 172 grain weight bullet, is given as 3.0". This indicates that the path described by the bullet in flight is at 100 yards 3.0" higher than the horizontal plane between gun muzzle and the point of impact at 200 yards.

Figures denoting the penetration of rifle cartridges have been omitted because they are of little practical value.



Table of Average Ballistics of Rifle Cartridges

CALIBER	BULLET		VELOCITY		ENERGY		MID RANGE TRAJECTORY		
	Weight grains	Type	Muzzle (Ft. per Sec.)	at 100 yds.	Muzzle (Ft. Lbs.)	at 100 yds.	100 Yards	200 Yards	300 Yards
22 BB Caps.....	20	Lead	780	570	27	13	.....	.....	.....
22 CB Caps.....	29	Lead	720	605	33	24	.....	.....	.....
22 Short.....	29	Lead	970	.....	65	.....	5.8	.....	.....
22 Long.....	29	Lead	1030	.....	68	.....	5.3	.....	.....
22 Long Rifle.....	40	Lead	1100	950	108	80	4.2	.....	.....
22 W. R. F.....	45	Lead	1105	955	122	91	4.0	.....	.....
218 Bee.....	46	O.P.	860	2260	835	520	0.7	3.5	10.5
219 Zipper.....	46	O.P.	3390	2720	1175	755	0.4	2.5	7.0
219 Zipper.....	56	O.P.	3050	2530	1155	795	0.6	2.5	8.0
22 Hornet.....	45	O.P.	2650	2080	700	430	0.8	4.0	12.5
22 Hornet.....	45	S.P.	2600	2210	675	490	0.8	3.5	10.0
22 Savage High Power.....	70	O.P.	2810	2400	1230	900	0.7	3.0	8.0
220 Swift.....	46	O.P.	4140	3370	1750	1160	0.3	1.5	4.5
220 Swift.....	48	S.P.	4140	3490	1825	1300	0.3	1.5	3.5
220 Swift.....	56	O.P.	3690	3090	1695	1190	0.4	2.0	4.5
6.5 mm Mann. Schoen.....	150	S.P.	2260	2030	1700	1375	0.9	4.0	10.5
25-20 S. S.....	86	S.P.	1380	1150	365	255	2.6	13.0	33.5
25-20 Winchester.....	86	S.P.	1450	1190	400	270	2.6	11.5	31.5
25-20 Winchester.....	60	O.P.	2210	1700	650	385	1.1	6.0	18.5
25 Remington.....	117	S.P.	2300	2020	1375	1060	0.9	4.5	11.0
25 Remington.....	87	O.P.	2710	2300	1420	1020	0.7	3.5	9.0
250 Newton.....	129	O.P.	2760	2540	2180	1840	0.6	2.7	6.6
257 Roberts.....	87	O.P.	3220	2770	2005	1485	0.5	2.5	6.0
257 Roberts.....	100	O.P.	2900	2530	1870	1420	0.6	2.5	7.0
257 Roberts.....	117	O.P.	2630	2330	1800	1410	0.7	3.0	8.0
25-35 Winchester.....	117	S.P.	2280	1970	1350	1010	1.0	4.5	12.0
25-35 Winchester.....	87	O.P.	2650	2250	1355	980	0.7	3.5	9.5
250 Savage.....	100	O.P.	2810	2490	1755	1375	0.6	3.0	7.0
250 Savage.....	87	O.P.	3040	2600	1785	1305	0.6	2.5	7.0
270 Winchester.....	150	S.P.	2770	2490	2560	2065	0.6	3.0	7.0
270 Winchester.....	130	O.P.	3140	2820	2850	2295	0.5	2.0	5.5
270 Winchester.....	100	S.P.	3540	3210	2785	2290	0.4	1.5	4.5
275 H. & H. Mag.....	175	S.P.	2690	2450	2810	2332	0.7	2.9	7.2

Table of Average Ballistics of Rifle Cartridges—Continued.

7 m/m Mauser.....	175	O.P.	2460	2220	2350	1915	0.8	3.5	9.0
7 m/m Mauser.....	139	O.P.	2900	2610	2600	2105	0.6	2.5	6.5
30-30 Winchester.....	186	Belted	2120	1840	1800	1360	1.0	5.0	15.0
30-30 Winchester.....	170	S.P.	2200	1930	1830	1405	1.0	4.5	12.0
30-30 Winchester.....	165	O.P.	2200	1920	1770	1350	1.0	4.5	12.5
30-30 Winchester.....	150	O.P.	2380	2060	1890	1415	0.9	4.0	11.0
30-30 Winchester.....	125	O.P.	2560	2160	2110	1500	0.8	4.0	10.5
30-30 Winchester.....	110	O.P.	2720	2260	1810	1250	0.7	3.5	10.0
30 Remington.....	180	Belted	2070	1800	1720	1300	1.0	5.5	14.5
30 Remington.....	170	S.P.	2170	1900	1780	1365	1.0	5.0	12.5
30 Remington.....	165	O.P.	2170	1890	1730	1310	1.0	5.0	12.5
30 Remington.....	125	O.P.	2450	2060	1670	1180	0.9	4.0	11.5
30 Remington.....	110	O.P.	2520	2080	1550	1060	0.8	4.0	11.5
30-40 Krag.....	220	O.P. or S.P.	2190	1980	2345	1915	1.0	4.5	11.0
30-40 Krag.....	180	S.P.	2480	2210	2460	1955	0.8	3.5	9.0
30-06.....	225	Belted S.P. or O.P.	2310	2070	2670	2150	0.9	4.0	10.5
30-06.....	180	O.P.	2410	2190	2840	2345	0.8	3.5	9.0
30-06.....	172	F.J.	2710	2420	2940	2340	0.7	3.0	7.5
30-06.....	150	Br. Ft.	2700	2500	2785	2385	0.6	3.0	6.5
30-06.....	110	O.P.	2960	2720	2920	2465	0.5	2.5	6.0
300 H. & H. Mag.....	220	O.P.	3380	2850	2790	1980	0.4	2.0	6.0
300 H. & H. Mag.....	180	S.P. Lt.	2730	2490	3640	3030	0.6	2.5	7.0
300 H. & H. Mag.....	180	O.P. Lt.	3060	2750	3745	3025	0.5	2.5	6.0
7.62 mm Russian.....	150	Br. Ft.	2810	2570	2635	2205	0.6	2.5	6.5
300 Savage.....	200	Belted	2220	1960	2190	1710	1.0	4.5	12.0
300 Savage.....	180	S.P.	2380	2140	2265	1830	0.8	4.0	10.0
300 Savage.....	150	S.P.	2660	2430	2360	1970	0.7	3.0	7.5
300 Newton.....	180	O.P.	2860	2664	3270	2860	0.5	2.5	5.4
303 Savage.....	195	S.P.	1960	1740	1665	1310	1.3	6.0	14.5
303 Savage.....	190	S.P.	1960	1740	1620	1280	1.3	6.0	14.5
303 Savage.....	180	Belted	2120	1840	1800	1360	1.0	5.0	13.5
303 British.....	215	S.P.	2160	1940	2230	1795	1.0	4.5	11.5
8 mm Mauser & Mann.....	236	S.P.	1890	1890	2310	1875	1.1	5.0	12.0
8 mm Mauser & Mann.....	200	S.P.	2105	1940	2055	1670	1.1	4.5	11.5
8 mm Lebel.....	170	S.P.	2610	2320	2575	2030	0.7	3.0	8.5
32-20 Winchester.....	100	S.P.	1280	1060	365	300	3.1	15.0	40.5
32-20 Winchester.....	115	S.P.	1280	1080	420	332	3.1	14.5	37.5



Table of Average Ballistics of Rifle Cartridges ... Continued

CALIBER	BULLET		VELOCITY		ENERGY		MID RANGE TRAJECTORY		
	Weight grains	Type	Muzzle at 100 yds. (Ft. per Sec.)	Muzzle at 100 yds. (Ft. Lbs.)	Muzzle at 100 yds. (Ft. Lbs.)	100 Yards	200 Yards	300 Yards	
32-20 Winchester	80	O.P.	2050	1520	745	1.4	7.5	23.0	
32 Winchester Spl.	180	Belted	2200	1910	1940	1.0	5.0	12.5	
32 Winchester Spl.	170	S.P.	2260	1960	1930	1.0	4.5	12.0	
32 Winchester Spl.	165	O.P.	2260	1950	1870	1.0	4.5	12.0	
32 Winchester Spl.	110	O.P.	2630	2140	1690	0.7	3.5	11.5	
32 Remington	180	Belted	2070	1800	1715	1.2	5.5	14.0	
32 Remington	170	S.P.	2200	1910	1830	1.0	5.0	13.0	
32 Remington	165	O.P.	2200	1900	1775	1.0	4.5	12.5	
32 Remington	110	O.P.	2630	2140	1690	0.8	4.0	11.0	
32-40 Winchester	165	S.P.	1440	1230	760	2.6	12.0	28.0	
32-40 High Velocity	165	S.P.	1950	1650	1395	1.4	6.5	17.5	
33 Winchester	200	S.P.	2180	1870	1555	1.1	5.0	13.5	
348 Winchester	210	Belted	2510	2180	2850	0.8	3.5	10.0	
348 Winchester	200	S.P.	2520	2160	2820	0.8	4.0	10.0	
348 Winchester	150	S.P.	2880	2380	2765	0.6	3.0	8.5	
35 Winchester	250	S.P.	2160	1910	2590	1.1	5.0	12.0	
35 Remington	210	Belted	2080	1760	2020	1.2	5.5	15.0	
35 Remington	200	O.P. or S.P.	2180	1870	2110	1.0	5.0	13.0	
35 Remington	150	O.P.	2360	1930	1860	1.0	5.0	13.5	
375 H. & H. Magnum	300	S.P.	2540	2290	4300	0.7	3.5	8.5	
375 H. & H. Magnum	270	S.P.	2720	2460	4440	0.7	3.0	7.0	
375 H. & H. Magnum	235	O.P.	2860	2520	4270	0.6	2.5	7.0	
38-40 Winchester	180	S.P.	1310	1090	685	3.2	15.5	37.5	
38-40 High Velocity	180	S.P.	1770	1380	1755	1.7	9.0	24.5	
38-40 High Velocity	145	O.P.	2060	1520	1365	1.3	8.0	22.0	
38-55	255	S.P.	1320	1150	985	3.0	13.5	32.5	
38-55 High Velocity	255	S.P.	1600	1370	1450	1.9	9.0	24.5	
405 Winchester	300	S.P.	2220	1940	3285	1.0	4.5	12.0	
44-40 Winchester	200	S.P.	1300	1070	750	3.3	17.5	38.0	
44-40 High Velocity	200	S.P.	1570	1220	1095	2.2	11.0	30.0	
44-40 High Velocity	160	O.P.	1980	1430	1395	1.6	8.0	25.5	
45-60 Winchester	300	Lead	1390	1170	1285	2.6	12.5	30.5	
45-70 Winchester	405	S.P.	1310	1160	1545	2.9	12.5	31.0	
45-90 Winchester	300	S.P.	1530	1270	1560	2.2	11.0	26.5	

Table of Average Ballistics of Pistol and Revolver Cartridges

CALIBER	Type of Bullet	Weight of Bullet (Grains)	Muzzle Velocity (Ft. per Sec.)	Muzzle Energy (Ft. Lbs.)	Penetration $\frac{2}{8}$ " pine boards
25 Auto (6.35 m/m)	F. J.	50	820	75	3
30 Mauser (7.63 m/m)	F. J.	86	1420	385	11
30 Luger (7.65 m/m)	S. P.	93	1250	325	11
32 S. & W.	Lead	88	720	98	3
32 S. & W.	Lead	88	720	100	3
32 S. & W. Long	Lead	98	820	146	4 1/2
32 S. & W. Long	M. P.	95	820	142	4 1/2
32 Short Colt	Lead	80	800	114	3
32 Long Colt	Lead	82	800	117	3
32 Colt New Police (Police Pos.)	Lead	100	795	139	3
32 Auto (7.65 m/m)	F. J.	74	980	158	5
9 m/m Luger	Lead	100	1030	235	6
357 Magnum	F. J.	124	1150	365	10
380 Auto (9 m/m)	M. P.	158	1510	800	12 1/2
38 Colt Auto	F. J.	95	970	199	5 1/2
38 S. & W.	F. J.	130	1070	331	9
38 S. & W.	Lead	146	745	180	4 1/2
38 S. & W.	M. P.	143	745	177	4 1/2
38 Special	Lead	200	745	217	5
38 Special	Lead	158	870	266	7 1/2
38 Special	M. P.	158	870	266	7 1/2
38 Special	W. C.	148	870	249	10
38-44 Highspeed	M. P.	158	1115	436	4
38 Short Colt	Lead	130	770	171	4
38 Long Colt	Lead	150	785	205	6
41 Short Colt	Lead	163	720	186	4
41 Long Colt	Lead	195	745	211	5
44 S. & W. American	Lead	218	695	324	4
44 S. & W. Russian	Lead	246	770	324	4
44 S. & W. Special	Lead	246	770	324	4
44 S. & W. Special	M. P.	246	770	324	8
45 Colt	Lead	250	870	421	6
45 A. C. P.	F. J.	230	860	378	6
45 A. C. P.	Lead	230	820	343	6



## A Rifleman's Table of Weights and Measures

The unit of weight used in the United States and Great Britain is the pound. The weights of bullets and powders are given in the Avoirdupois System. The unit of length (space) employed is the foot. In Continental Europe and other parts of the world, the metric system of weights and measures is employed. Tables, which the rifleman frequently needs, are given below along with a conversion table.

### WEIGHT

Avoirdupois System		Metric System	
27 11/32 grains.....	1 dram	1000 grams.....	1 kilogram
16 drams.....	1 ounce	1000 kilograms.....	1 metric ton
16 ounces.....	1 pound		
2000 pounds.....	1 ton		

NOTE:—The grain weight is the same in all tables; Avoirdupois, Apothecarie or Troy.

1 pound Avoirdupois equals 16 ounces Avoirdupois or 7000 grains.  
~~5250~~ 1 pound Apothecaries or Troy equals 12 ounces Troy or Apothecaries or 5760 grains.

1 ounce Avoirdupois equals 437.5 grains.

1 ounce Apothecarie or Troy equals 480 grains.

1 grain.....	.064779 grams	1 gram.....	15.432 grains
1 oz. Avd.....	28.349 grams	1 gram.....	0.035274 ounces Avd.
1 lb. Avd.....	453.59 kg.	1 kg.....	2.2046 lbs.
1 cwt.....	50.802 kg.	1 kg.....	0.019684 cwt.
1 ton.....	1.0160 metric tons	1 metric ton.....	0.98421 tons

### LENGTH

12 inches.....	1 foot	10 millimeters.....	1 centimeter
3 feet.....	1 yard	10 centimeters.....	1 decimeter
5 1/2 yards.....	1 rod	10 decimeters.....	1 meter
1 yard.....	0.91438 meters	1 meter.....	1.0936 yards
1 foot.....	0.30479 meters	1 meter.....	3.2809 feet
1 inch.....	2.5400 cm.	1 cm.....	0.39371 inches
1000 yards.....	914.38 meters	1 kilometer.....	1093.6 yards

### PROPERTIES OF METALS WHICH THE HANDLOADER USES

	Lead	Tin	Antimony	Steel	Copper	Nickel
Specific Gravity.....	11.3	7.3	6.8	7.8	8.7	8.8
Melting Point (Fahr.).....	625	440	1160	2500	2000	3000
Weight per cubic inch in gr..	2880	1840	1710	1960	2250	2200

## Rifling in Firearms

Firearms had been in use for more than one hundred years before rifling was invented. The knowledge that spinning a projectile adds to its steadiness in flight has been known since primitive times. The difficulty, in the case of firearms, lay in the application of the principle. Spiral grooving would spin a bullet if it were gripped tightly by the rifling. This principle was applied to sporting and target arms, but loading was slow and laborious because a tight fitting bullet had to be carefully forced down the full length of the barrel. Many attempts were made to overcome this difficulty by devising bullets with cupped bases which would pass freely down the bore and, when fired, expand into and grip the rifling. Some fair degree of success attended these efforts. The introduction of breech loading arm permitted the use of bullets which were large enough to grip the rifling and thus be rotated.

The grooves of the rifling in modern arms are usually cut three to five thousandths of an inch in depth. High places between these "grooves" are called "lands". Groove diameter of an ordinary barrel is about eight thousandths of an inch larger than the bore diameter. Shooters desiring to know the rate of twist of the rifling of any gun barrel may obtain this information in the following manner. Force a lead slug through the bore as explained previously under "Sizing and Lubricating Cast Bullets" page 57. Next drill a hole through this slug slightly smaller than the thread of your cleaning rod. Thread the rod into this slug, being careful not to expand it. Place a straight mark along the full length of the rod and start the slug into the rifle barrel until the slug is flush with the muzzle. With a lead pencil mark the muzzle exactly opposite the mark running up the rod. Now push the slug and the rod down the bore, watching the long mark on the rod until it makes one complete turn and comes back precisely to your mark on the gun muzzle.

The distance the rod travels will equal the rate of twist of the rifling. When starting the bullet in the barrel it is necessary to fit carefully the barrel lands into the cuts previously made by them in the bullet. The rate of twist in some of the older rifles is very slow, some being bored with only one twist in sixty inches, while to-day some of our modern rifles will have twists of one turn in 6 1/2 inches. A large proportion of modern rifles have a rate of twist equal to one turn in 10 to 12 inches. We call this matter of twist of rifling to the attention of handloaders because, while the bullet may be of the correct diameter for the barrel in question, it may not be of proper design and to obtain accuracy with it may be impossible. Long slender bullets require a proportionately quicker twist than do others to hold them point on while in flight. If such a bullet tends to "keyhole," the remedy is more power or speed, if obtainable with safety. If increased speed cannot be obtained, then accurate loads cannot be assembled with a long slender bullet and the remedy is to try one of a shorter design.



Table of Rate of Twist of Rifles and Groove Diameters

NAME AND CALIBER	Manufacturer	Twist in inches	Groove Diameters	
			Min. inches	Maximum
22 Short .....	All .....	20	.222	.2238
22 Long Rifle .....	All .....	16-17	.222	.2238
22 W. R. F. ....	Winchester .....	14	.222	.2238
218 Bee .....	Winchester .....	16	.224	.224
219 Zipper .....	Winchester .....	16	.224	.224
22 Hornet .....	Winchester & Savage .....	16	.223	.224
220 Swift .....	Winchester .....	14	.224	.2245
22 Savage H. P. ....	Savage .....	12	.226	.2265
25 Rim Fire .....	Stevens .....	16-17	.257	.2576
25-20 Single Shot .....	Stevens .....	13	.255	.257
25-20 Repeater .....	Remington & Marlin .....	12	.257	.2575
25-20 Repeater .....	Winchester & Savage .....	14	.257	.2575
25-35 .....	Winchester & Savage .....	8	.257	.2575
25 Remington Rimless .....	Remington .....	10	.257	.2575
25-36 Marlin .....	Marlin .....	9	.257	.2575
257 Roberts .....	Remington .....	10	.256	.258
250-3000 Savage .....	Savage .....	14	.257	.258
6mm U. S. Navy .....	Remington .....	6 1/2	.242	.244
6.5mm Mannlicher .....	Hoffman .....	7 1/2	.263	.264
256 Newton .....	Hoffman .....	10	.265	.2655
270 Winchester .....	Winchester .....	10	.278	.2785
280 Ross .....	Ross .....	8.7	.289	.290
7mm Mauser .....	American .....	10	.2845	.2855
30-30 Winchester .....	Winchester .....	32	.308	.3085
30-30 Winchester .....	Marlin & Savage .....	30	.308	.3085
30 Remington Rimless .....	Remington .....	12	.308	.3085
30-40 Krag .....	U. S. Government & Winchester .....	4, 10	.308	.310
30-1906 Springfield .....	U. S. Gov't. Win. & Rem. ....	10	.308	.3085

Table of Rate of Twist of Rifles and Groove Diameters

NAME AND CALIBER	Manufacturer	Twist in inches	Groove Diameter	
			Min. inches	Maximum
300 H. & H. Magnum .....	Winchester .....	10	.308	.309
32-20 .....	Winchester & Remington .....	20	.311	.312
32-20 .....	Marlin .....	22	.311	.3125
32-40 .....	All .....	16	.320	.3205
32 Winchester Special .....	Winchester .....	16	.320	.321
32 Remington Rimless .....	Remington .....	14	.319	.320
8mm Mauser .....	German .....	9-10	.314	.327
303 British .....	Winchester .....	12	.312	.314
303 British .....	Remington .....	9	.312	.314
303 Savage .....	Savage .....	10	.308	.309
33 Winchester .....	Winchester & Marlin .....	12	.338	.340
348 Winchester .....	Winchester .....	12	.348	.349
35 Remington Rimless .....	Remington .....	16	.356	.357
35 Winchester .....	Winchester .....	12	.358	.359
375 H. & H. Magnum .....	Winchester .....	12	.376	.377
38-40 Winchester .....	Winchester & Marlin .....	36	.3995	.4005
38-40 Remington .....	Remington .....	20	.3995	.4005
38-55 .....	Winchester & Savage .....	18	.379	.3795
38-55 .....	Marlin .....	20	.379	.3795
38-55 .....	Winchester .....	20	.379	.3795
40-60 Winchester .....	Winchester .....	40	.403	.405
40-60 Marlin .....	Marlin .....	20	.403	.405
405 Winchester .....	Winchester .....	14	.412	.414
44-40 Winchester .....	Winchester & Marlin .....	36	.428	.4295
44-40 Remington .....	Remington .....	20	.424	.426
45-70 .....	U. S. Government .....	22	.457	.458
45-90 .....	Winchester .....	32	.457	.459
50-95 Winchester .....	Winchester .....	60	.512	....
58 Government M. L. ....	U. S. Government .....	68	.590	....



Table of Rate of Twist of Revolvers and Groove Diameters

NAME & CALIBER	Manufacturer	Twist in inches	Standard Groove Diameter
22 Long Rifle.....	S. & W.	15R	.2235
22 Colt.....	Colt	14L	.222
30 Mauser.....	German	S	.309
30 Luger.....	Colt	9.85R	.310
32 Colt Auto.....	S. & W.	16L	.311
32 S. & W.....	S. & W.	18 $\frac{3}{4}$ R	.313
32-20 Colt.....	S. & W.	12R	.312
32 Colt.....	Colt	16L	.312
357 Magnum.....	S. & W.	18 $\frac{3}{4}$ R	.357
38 S. & W.....	S. & W.	18 $\frac{3}{4}$ R	.357
38 S. & W. Special.....	S. & W.	18 $\frac{3}{4}$ R	.357
38 Colt Special.....	Colt	16L	.354
38 Colt Auto.....	Colt	16L	.356
38 Colt Revolver.....	Colt	16L	.354
38-40 Colt.....	Colt	16L	.402
41 Colt.....	Colt	16L	.402
44-40 Colt (old models).....	Colt	16L	.424
44-40 Colt (new models).....	Colt	16L	.424
44 S. & W.....	Colt	16L	.427
44 Colt.....	Colt	20R	.431
45 Auto Colt Pistol.....	S. & W.	16L	.427
45 Auto Colt Pistol.....	Colt	16L	.451
45 Colt.....	Colt	16L	.452

"R" indicates Right or Clock-wise.

"L" indicates Left or Counter-clock-wise rifling twist.

Table of Bullet Seating Depths

The following is a table showing the generally accepted depth to which standard makes of bullets are seated in cartridge cases used in rifles. The handloader need not adhere closely to these figures except when maximum loads are used.

Caliber	Bullet	Seating Depth
22 Hornet.....	45 gr SP	.20"
22 Savage Hi-Power.....	70 gr SP	.40"
220 Swift.....	48 gr SP	.18"
220 Swift.....	53 gr SP	.25"
25-20 Single Shot.....	86 gr SP	.40"
25-20 Repeater.....	60 gr OP	.28"
25-20 Repeater.....	86 gr SP	.45"
25 Remington.....	87 gr OP	.30"
25 Remington.....	117 gr SP	.45"
257 Roberts.....	87 gr OP	.25"
257 Roberts.....	100 gr OP	.35"
257 Roberts.....	117 gr OP	.45"
25-35 Winchester.....	87 gr OP	.30"
25-35 Winchester.....	100 gr OP	.35"
25-35 Winchester.....	117 gr SP	.43"
25-36 Winchester.....	117 gr SP	.55"
250 Savage.....	87 gr SP	.20"
250 Savage.....	106 gr OP	.35"
270 Winchester.....	136 gr OP	.30"
30 Remington.....	110 gr OP	.25"
30 Remington.....	170 gr SP	.50"
30-30.....	110 gr OP	.25"
30-30.....	150 gr OP	.30"
30-30.....	170 gr SP	.45"
300 Savage.....	110 gr OP	.20"
300 Savage.....	156 gr B. Pt.	.40"
300 Savage.....	180 gr SP	.40"
300 H & H Magnum.....	180 gr OP	.60"
30-06.....	110 gr OP	.18"
30-06.....	150 gr OP	.25"
30-06.....	173 gr FJ	.48"
30-06.....	180 gr SP	.38"
30-06.....	220 gr SP	.45"
30-40 Krag.....	110 gr OP	.18"
30-40 Krag.....	150 gr OP	.25"
30-40 Krag.....	173 gr FJ	.48"
30-40 Krag.....	180 gr SP	.40"
30-40 Krag.....	220 gr SP	.43"
303 Savage.....	190 gr SP	.53"
303 British.....	174 gr FJ	.43"
303 British.....	215 gr SP	.38"
32 Remington.....	110 gr OP	.20"
32 Remington.....	170 gr SP	.48"
32 Winchester Spl.....	110 gr OP	.20"
32 Winchester Spl.....	170 gr SP	.40"
32-20.....	80 gr OP	.20"
32-20.....	115 gr SP	.35"
32-40.....	110 gr OP	.20"
32-40.....	165 gr SP	.50"
33 Winchester.....	200 gr SP	.35"
348 Winchester.....	150 gr SP	.25"
348 Winchester.....	200 gr SP	.45"
35 Remington.....	150 gr OP	.20"
35 Remington.....	200 gr SP	.30"
35 Winchester.....	250 gr SP	.55"
375 H & H Magnum.....	300 gr SP	.45"
38-40.....	130 gr OP	.24"
38-40.....	180 gr SP	.30"
38-55.....	238 gr SP	.53"



405 Winchester.....	300 gr SP	.38"
44-40.....	200 gr SP	.30"
45-70.....	300 gr SP	.45"
45-90.....	300 gr SP	.43"
45-90.....	405 gr SP	.65"
6 m/m Navy.....	112 gr SP	.25"
6.5 m/m Mann. Sch.....	129 gr OP	.28"
6.5 m/m Mann. Sch.....	140 gr OP	.30"
6.5 m/m Mann. Sch.....	160 gr SP	.30"
7 m/m Mauser.....	139 gr FJ	.25"
7 m/m Mauser.....	175 gr FJ	.40"
7.62 m/m Russian.....	110 gr OP	.20"
7.62 m/m Russian.....	150 gr OP	.25"
7.62 m/m Russian.....	173 gr FJ	.47"
7.62 m/m Russian.....	220 gr SP	.38"
8 m/m Mauser.....	154 gr FJ	.25"
8 m/m Mauser.....	110 gr SP	.175"
8 m/m Mauser.....	139 gr SP	.20"
8 m/m Mauser.....	170 gr SP	.27"
8 m/m Mauser.....	236 gr SP	.25"
9 m/m Manlicher.....	280 gr SP	.38"

### Table of Cartridge Case Lengths

The following is a table of the generally accepted over-all length of the more popular standard caliber cartridge cases and some of the custom made cases wherever a standard length has been generally agreed upon.

22 Hornet.....	1.40"	32 Long Colt.....	.92"
22 K. Hornet.....	1.39"	32 S & W Long.....	.92"
218 Bee.....	1.35"	32 Colt New Police.....	.92"
22 Savage Hi-power.....	2.05"	32-20.....	1.31"
219 Zipper.....	1.94"	32 (7.65 m/m) ACP.....	.93"
2 R Donaldson (Lovell).....	1.635"	32 Winchester Spl.....	2.04"
22-250 (Varminter).....	1.905"	32 Remington.....	2.05"
219 Wasp (Rimless).....	1.747"	32-40.....	2.13"
219 Wasp (Rimmed).....	1.775"	8 m/m Lebel.....	1.98"
220 Swift.....	2.21"	8 m/m Mann. Sch.....	2.22"
25 Auto.....	.62"	8 m/m Mauser.....	2.24"
25-20 Repeater.....	1.33"	33 Winchester.....	2.11"
25-20 Single-Shot.....	1.63"	348 Winchester.....	2.26"
25-35.....	2.04"	35 Winchester.....	2.42"
25 Remington.....	2.05"	35 Remington.....	1.92"
250 Savage.....	1.91"	375 H & H Magnum.....	2.85"
257 Roberts.....	2.23"	38 S & W.....	.77"
256 Newton.....	2.47"	38 Colt New Police.....	.77"
6 m/m Navy.....	2.35"	38 Short Colt.....	.69"
6.5 m/m Mann.....	2.15"	38 Long Colt.....	1.03"
270 Winchester.....	2.54"	38 S & W Spl.....	1.16"
275 H & H Magnum.....	2.85"	38 Colt Spl.....	1.16"
280 Ross.....	2.61"	38 ACP.....	.90"
7 m/m Mauser.....	2.24"	38-40.....	1.31"
7.62 m/m Russian.....	2.11"	380 Auto.....	.68"
30 (7.63 m/m) Mauser.....	1.04"	38-55.....	2.13"
30 (7.65 m/m) Luger.....	.85"	9 m/m Luger.....	.76"
30-30.....	2.04"	40-82.....	2.39"
30 Remington.....	2.05"	401 Winchester.....	1.50"
300 Savage.....	1.87"	405 Winchester.....	2.58"
30-40 Krag.....	2.31"	44 S & W Russian.....	1.02"
30-'03.....	2.62"	44 S & W Spl.....	1.17"
30-06.....	2.49"	44-40.....	1.31"
30 Newton.....	2.54"	45 Colt.....	1.28"
300 H & H Magnum.....	2.85"	45 ACP.....	.90"
303 Savage.....	2.02"	45 Auto Rim.....	.90"
303 British.....	2.21"	45-70.....	2.10"
32 S & W.....	.60"	45-90.....	2.40"
32 Short Colt.....	.64"	50-110.....	2.41"

## Table of Full Power Charges For Rifles

The following tables of suggested charges for rifles, revolvers and pistols have been compiled from various sources of information which we believe to be reliable. We believe the handloader will find them of assistance when developing the powder charge. They should be safe to use in all arms in good mechanical condition when used in conjunction with cartridge components of similar quality. However, having no control over the condition of the arms in which they may be used, the methods of loading or selection of cartridge components, we assume no responsibility for their use

*Do not use this table until you have read the Sections of this Handbook entitled "Gunpowders" (Page 25), "How to Develop the Powder Charge" (Page 30), and "Indications of Excessive Pressures" (Page 30).*

The following Table does not include recommended charges for the new series of Dupont powders, viz. 4227, 4198, 3031, 4320 and 4064. Loading data for these will be found beginning on page 102.



Table of Full Power Charges for Rifles

Bullet Weight & Style	Her- cules HiVel No. 2	Velo- city	Her- cules HiVel	Du- Pont No. 17½	Her- cules HiVel No. 2	Velo- city	Her- cules Lightning	Velo- city	Her- cules Sharp- shooter	Velo- city	Her- cules No.	Velo- city	Her- cules Unique	Velo- city
220 SWIFT														
46j	20.0 35.2	2375 3920	15.0 33.2	1970 3935	15.0 30.2	2150 3745	14.0 22.2	2360 3430	15.0 20.5	2510 3135	10.0 14.0	2300 2840		
48j	20.0 34.8	2225 3785	18.0 33.8	2300 3840	15.0 30.4	2050 3645	14.0 22.4	2410 3350				2240 2835		
Bullet Weight & Style	Du- Pont No. 17½	Velo- city	Her- cules HiVel No. 2	Velo- city	Du- Pont No. 15½	Her- cules HiVel No. 3	Velo- city	Du- Pont No. 1204	Her- cules No.	Velo- city	Du- Pont No. 1147	Velo- city		
22 HORNET														
45j								7.0 10.4	1532 2555	5.0 10.4	1475 2440			
22 SAVAGE HP														
70j	21.8 28.1	2230 2800	10.0 25.4	1140 2970		10.0 22.6	1440 3050			8.0 17.6	1500 2670			
25-20 SINGLE SHOT														
60j								11.0	1735	10.8	1880			
25-20 REPEATER														
60j								8.2 12.2	1265 2050	7.5 10.5	1450 2075			
86j								9.3 11.3	1395 1740	6.5 9.5	1030 1740			

Table of Full Power Charges for Rifles

Bullet Weight & Style	Du- Pont No. 17½	Velo- city	Her- cules HiVel No. 2	Velo- city	Du- Pont No. 15½	Her- cules HiVel No. 3	Velo- city	Du- Pont No. 1204	Her- cules No.	Velo- city	Du- Pont No. 1147	Velo- city		
25 REMINGTON RIMLESS														
60j	32.5 35.5	2775 3110	18.0 31.8	1850 3220		16.0 28.5	1990 3390	18.5 23.5	2250 2720	12.0 20.9	1940 3040			
87j	30.0 34.0	2500 2820	14.0 30.3	1360 2870		15.0 26.7	1770 2900	17.0 21.5	1905 2575	10.0 19.4	1530 2490			
100j	27.0 31.2	2300 2630	12.0 28.1	1270 2630		10.0 24.0	1250 2590			10.0 18.7	1245 2255			
117j	25.7 31.2	2128 2554	10.0 26.4	1010 2420		8.0 23.5	1020 2430	20.0 22.7	1060 2140	12.0 18.3	1420 2085			
25-35 WINCHESTER														
60j	27.5 30.6	2550 2910	15.0 26.0	1570 2840		15.0 23.6	1880 2960	17.0 22.5	2115 2760	12.0 20.1	1870 2880			
86j										15.6 22.8				
87j	21.5 30.2	1850 2650	15.0 24.5	1500 2450		15.0 21.9	1770 2565	15.0 19.5	1865 2350	12.0 16.5	1720 2240			
117j	23.2 26.0	1978 2250	12.0 22.1	1200 2100		9.0 18.6	1110 2050	12.5 18.0	1440 1975	10.0 15.0	1250 1840			
25-36 MARLIN														
86j	20.0 23.0	1815 2375												
117j	20.8 25.5	1866 2275												
250 SAVAGE, BOLT ACTION														
60j	28.0 30.0	2475 3200	18.0 33.6	1900 3360		18.0 28.8	2240 3410			14.0 22.3	2205 3145			
87j	33.0 40.6	2620 3200	13.0 33.0	1340 2995		13.0 27.6	1595 2925	23.0 28.0	2360 2815	11.0 20.5	1710 2565			



## 250 SAVAGE, BOLT ACTION—Continued

	30.0	24.5	13.0	13.10	37.4	27.40	10.0	12.35	21.0	21.10	9.0	12.60
100J	35.4	28.75	29.4	26.70	39.4	29.80	24.8	26.00	26.0	25.25	19.8	22.95
117J	31.0	24.00	13.0	12.00	35.4	25.10	10.0	11.90	.....	.....	10.0	11.50
	31.5	26.30	28.2	24.50	37.4	26.80	24.0	23.60	.....	.....	19.1	20.40

## 6mm U. S. NAVY

	32.6	27.10	34.3	24.00	27.2	23.60	.....	.....	.....	.....	.....	.....
112J	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

## 257 ROBERTS

	36.0	26.80	26.0	22.20	.....	24.0	23.15	.....	.....	.....	.....	.....
87J	40.0	29.85	39.0	32.95		36.8	33.20		.....	.....	16.0	20.25
100J	35.0	23.80	37.0	30.70		35.0	30.80		.....	.....	22.9	20.00
117J	36.4	25.00	36.8	28.70		32.7	28.00		.....	.....	22.6	24.10
	.....	.....	.....	.....		.....	.....		.....	.....	22.0	22.20

## 256 NEWTON

120J	33.0	22.10	.....	41.4	2500	.....	.....	.....	.....	.....	.....	.....
	43.5	27.25	.....	50.4	3000	.....	.....	.....	.....	.....	.....	.....

## 270 WINCHESTER

	44.0	25.85	25.0	16.40	47.0	27.05	19.0	14.90	30.0	22.65	17.0	15.00
130J	50.0	29.20	47.8	30.20	55.0	31.60	40.4	28.55	32.0	24.00	31.2	24.60
145J	44.4	25.25	24.0	15.20	47.6	26.00	21.0	16.10	.....	.....	18.0	15.70
	47.0	26.75	45.8	27.55	51.7	28.55	39.0	26.40	.....	.....	31.9	23.75

## 7 mm MAUSER

	46.0	28.00	20.0	14.80	46.5	27.25	13.0	12.85	.....	.....	10.0	11.75
130J	47.8	29.20	42.0	28.40	49.0	29.30	36.6	27.90	.....	.....	28.4	25.00
175J	33.3	20.50	18.0	13.20	40.4	23.00	13.0	11.90	.....	.....	.....	.....
	43.2	25.50	39.8	25.40	43.4	25.20	34.4	24.70	.....	.....	38.0	22.50

## 30-30 WINCHESTER, MARLIN &amp; SAVAGE, 30 REMINGTON RIMLESS

	35.0	23.60	19.2	15.25	.....	.....	15.0	14.00	.....	.....	12.0	15.20
110J	37.0	25.50	35.5	27.60		.....	33.2	29.20		20.0	20.40	21.3
150J	27.5	20.30	20.0	14.50		.....	15.0	13.00		.....	14.0	14.95
	34.8	25.00	30.9	23.00		.....	28.8	24.60		.....	24.2	22.50

## Table of Full Power Charges for Rifles

Bullet Weight & Style	30-30 WINCHESTER, MARLIN AND SAVAGE, 30 REMINGTON RIMLESS—Continued											
	Du- Pont No. 17½	Velo- city	Her- cules H&V No. 2	Velo- city	Du- Pont No. 15½	Her- cules H&V No. 3	Velo- city	Du- Pont No. 1204	Velo- city	Her- cules No. 2400	Velo- city	Du- Pont No. 1147
160J	28.1 31.2	1820 2050	..... .....	..... .....	..... .....	..... .....	..... .....	14.0	1650	..... .....	..... .....	..... .....
170J	29.0 34.3	2008 2300	17.5 30.0	1290 2175	..... .....	15.0 27.6	1320 2230	17.0 21.0	1500 1800	11.0 22.9	1200 2105	..... .....
30-1906 SPRINGFIELD												
80J (32-20)	51.0 57.0	2825 3350	36.0 50.5	2440 3400	..... .....	34.0 46.0	2575 3415	15.0 18.0	1400 1800	24.0 31.6	2595 3110	..... .....
110J (30-30)	37.0 56.0	2325 3325	35.0 49.8	2315 3280	41.0 60.0	2360 3250	2320 3320	29.0 35.0	2225 2600	22.0 29.0	2160 2600	50.0 62.0
150J	46.0 54.4	2575 3000	32.0 48.6	1995 2980	51.0 58.2	2700 3020	1855 2980	25.0 31.0	1850 2210	22.0 27.2	1940 2270	51.0 59.0
173J	39.0 51.0	2200 2800	30.0 45.8	1870 2760	52.0 53.5	2685 2810	1905 2760	22.5 29.0	1650 2025	20.0 27.3	1660 2120	50.5 54.5
170J (30-30)	46.0 52.0	2390 2740	30.0 46.0	1850 2720	46.5 50.5	2380 2590	1900 2705	..... .....	..... .....	20.0 27.0	1700 2075	..... .....
180J	45.0 50.0	2425 2675	30.0 46.2	1825 2755	48.0 53.1	2400 2650	1935 2740	21.0 29.0	1450 2000	18.0 26.3	1620 2130	46.0 54.5
200J	45.0 47.0	2385 2475	24.0 45.0	1400 2520	48.5	2400	1610 2475	..... .....	..... .....	18.0 26.2	1430 1895	..... .....
220J	42.0 48.0	2110 2350	28.0 43.6	1575 2430	46.0 52.0	2165 2455	1560 2380	..... .....	..... .....	18.0 25.8	1320 1800	43.0 50.0



Table of Full Power Charges for Rifles

Bullet Weight & Style	Du-Pont No. 17½	Her-cules HiVel No. 2	Velo-city	Du-Pont No. 15½	Her-cules HiVel No. 3	Velo-city	Du-Pont No. 1204	Her-cules No. 2400	Velo-city	Du-Pont No. 1147	Velo-city
30-40 Krag (30 U. S. Army)											
80J	45.0	2090	25.0	1890	23.0	1980	25.5	2200	20.0	2240	22.0
(32-20)	49.0	3025	43.2	3310	38.3	3470	31.0	2500	15.0	1770	15.0
110J	43.0	2050	23.0	1770	20.0	1840	23.5	2200	15.0	1770	15.0
(30-30)	50.0	3200	41.1	3040	35.9	3070	29.0	2500	26.5	2640	26.5
150J	40.0	2375	15.0	1080	15.0	1300	23.5	1750	14.0	1400	14.0
	47.3	2875	38.2	2680	34.1	2730	29.0	2225	26.0	2320	26.0
170J											
(30-30)											
173J	46.0	2075	36.2	1720	18.0	1580	22.0	1625	12.0	1190	12.0
	37.4	2210	22.0	1560	31.2	2400	26.5	1980	25.2	2130	25.2
180J	45.0	2000	36.0	2450		2375	25.5	1900		39.5	2260
										44.0	2480
190J	42.6	2425									
(303 Savage)											
220J	36.7	2000	18.0	1190	13.0	1080			12.0	1020	36.5
	41.6	2225	34.5	2130	29.7	2040			23.5	1740	42.0

7.62 mm RUSSIAN

110J	46.0	2680									
	53.0	3145									
160J	51.6	2875	28.0	1820	18.0	1370				49.0	2675
			43.6	2720	36.4	2665				54.5	3015
170J	45.0	2425									
173J											
180J	46.0	2500								48.0	2600
										50.0	2725
										48.0	2525
										50.0	2650

Table of Full Power Charges for Rifles

Bullet Weight & Style	Du-Pont No. 17½	Her-cules HiVel No. 2	Velo-city	Du-Pont No. 15½	Her-cules HiVel No. 3	Velo-city	Du-Pont No. 1204	Her-cules No. 2400	Velo-city	Du-Pont No. 1147	Velo-city
30 NEWTON											
110J					68.2	3500					
150J					71.7	3150					
180J					60.6	2650					
					69.5	3000					
220J					57.5	2380					
					62.5	2510					
303 BRITISH											
174J	41.0	2300	14.0	880	15.0	1180			13.0	1140	
	45.0	2530	32.7	2200	28.4	2170			21.3	1870	
215J	37.4	2000	12.0	760	11.0	890			12.0	1020	
	41.6	2230	30.8	1950	27.3	1900			20.3	1610	
300 SAVAGE											
150J	40.0	2450	20.0	1305	16.0	1320			13.0	1390	
	43.5	2675	39.2	2710	35.1	2750	27.0	2200	27.8	2450	
170J	44.0	2600	36.7	2400	32.1	2490			25.0	2180	
303 SAVAGE											
190J	36.0	1630	16.0	1070	12.0	950			10.0	910	
	32.6	1982	30.1	2080	27.4	2150			19.5	1820	
32 WINCHESTER SPECIAL AND REMINGTON RIMLESS											
110J	33.3	1950	22.0	1520	12.0	1110			13.0	1500	
	39.0	2425	35.4	2565	29.7	1870	20.0	2000	20.0	2250	
165J			31.4	2140	22.0	1740			18.7	1810	
170J	32.0	2025	18.0	1180	10.0	1020			10.0	1000	
	36.0	2250	32.0	2160	26.0	2090	18.0	1600	18.7	1825	



Table of Full Power Charges for Rifles

Bullet Weight & Style	Du-Pont No. 17½	Velo-city	Her-cules HiVel No. 2	Du-Pont No. 15½	Velo-city	Her-cules HiVel No. 3	Du-Pont No. 1204	Velo-city	Her-cules No. 2400	Velo-city	Du-Pont No. 1147	Velo-city
<b>32 WINCHESTER (32-20) RIFLE</b>												
80J	27.0	1750	16.0	1050	13.0	1080	16.0	1415	9.0	1020	8.0	1020
	31.0	2000	24.2	1750	20.0	1770	19.0	1750	15.1	1600	13.0	1845
115J							10.0	1355	8.0	970		
							13.0	1675	10.8	1555		
165J												
<b>32-40</b>												
<b>8 mm MAUSER and MANNLICHER SCHOENAUER</b>												
154J	40.0	2300	25.0	1640	20.0	1580						
	45.0	2500	42.2	2620	34.4	2580						
170J			42.0	2800								
227J					50.0	2225					43.0	1920
					52.0	2310					49.5	2180
236J	46.0	2200	18.0	1040	49.0	2175	16.0	1160			42.0	1895
			38.2	2160			30.0	2020			47.5	2120
<b>33 WINCHESTER</b>												
200J	42.0	2040	20.0	1180		20.0	1460					
	47.0	2260	43.2	2445		36.6	2455					
250J	63.0	2475			60.0	2430						
	70.0	2600			77.0	2750						
<b>35 NEWTON</b>												
<b>35 WINCHESTER</b>												
250J	38.0	1690	28.0	1370		22.0	1335					
	49.0	2220	47.0	2345		38.6	2235					

Table of Full Power Charges for Rifles

Bullet Weight & Style	Du-Pont No. 17½	Velo-city	Her-cules HiVel No. 2	Du-Pont No. 15½	Velo-city	Her-cules HiVel No. 3	Du-Pont No. 1204	Velo-city	Her-cules No. 2400	Velo-city	Du-Pont No. 1147	Velo-city
<b>35 REMINGTON RIMLESS</b>												
150J	35.0	1725	26.0	1540		22.0	1635	27.0	1990	22.0	1938	
	41.0	2120	40.2	2390		32.9	2440	35.0	2450	30.3	2465	
200J	36.5	1725	23.0	1280		18.0	1320	25.0	1760	20.0	1680	
	40.0	2040	37.2	2140		29.6	2100	31.0	2090	28.0	2135	
<b>38-40 RIFLE</b>												
130J							25.0	1520	18.0	1420		
							30.5	2010	26.0	2130		
180J							20.0	1160	17.0	1450		
							27.5	1855	22.6	1870		
<b>38-55</b>												
255J	33.3	1650	20.0	1070		16.0	1060					
	38.0	1825	20.0	1615		24.8	1710	24.0	1625			
<b>405 WINCHESTER</b>												
300J	59.0	2150	30.0	1180		21.0	1020			16.0	900	
	62.0	2250	53.4	2260		40.6	2255			34.4	1940	
<b>44 WINCHESTER (44-40) RIFLE</b>												
200J							25.0	1400	20.0	1385		
							30.0	1830	25.4	1870		
<b>45-70</b>												
300J	51.0	1700	25.0	1080		22.0	1040					
	59.0	2015	53.4	2165		40.8	1885					
<b>45-90</b>												
300J	54.0	1650	38.0	1490		32.0	1420					
	60.0	1950	54.0	2000		46.0	2060					
405J	57.5	1815	50.0	1785		41.8	1790	35.0	1550			



## Table of Full Powder Charges For Rifles, Featuring Charges Using the New Series of Du Pont Powders



E. I. DuPont de Nemours and Company have introduced a new series of progressive burning powders known as DuPont I. M. R. Nos. 4227, 4198, 3031, 4320 and 4064. In the order named, they are similar to DuPont I. M. R. Nos. 1204, 25½ (never available to handloaders) 17½, 1147 and 15½ and have the same burning characteristics. They do not, however, contain any incorporated metal since cupro-nickel metal-cased bullets have been pretty generally supplanted by projectiles jacketed with gilding metal.

Tests have indicated that the accuracy obtainable with this new series of rifle powders is the equal, if not slightly superior, to the older series of DuPont Improved Military powders.

This series of I. M. R. powders has gradually replaced the older series. While, the new series is similar to the old, the weights of charges are not comparable. The following Table of Charges gives the recommended weights of charges to be used.

Do not use this table until you have read the Sections of this Handbook entitled "Gunpowders" (Page 25,) "How to Develop the Powder Charge", (Page 30) and "Indications of Excessive Pressures" (Page 30).

Bullet	Grs. Wt.	Powder kind	Charge grs.	Velocity
<b>22 Hornet</b>				
Lead G. K.	43	2400	7.5	1910
Lead	46	Unique	4.5	1500
J	35	2400	11.5	3020
J	40	2400	11.2	2860
J	45	2400	9.5	2400
J	45	4227	8.5	2040
J	45	4227	10.8	2410

Bullet	Grs. Weight	Powder Kind	Charge Grs.	Velocity
<b>22 K Hornet</b>				
J	40	4227	13.0	3030
J	40	4227	13.5	3040
J	40	4227	14.0	3210
J	45	4227	13.0	2950
J	46	2400	12.0	2980
J	46	2400	12.5	3110
J	50	4227	11.0	2460
J	50	4227	11.5	2590
J	50	4227	12.0	2650
J	50	4227	12.5	2700
J	40	2400	13.0	3280
J	45	2400	12.5	3110

<b>219 Donaldson Wasp</b>				
J	45	4198	25.0	....
J	45	3031	28.0	3700
J	45	4320	29.0	....
J	45	4064	27.0	....
J	50	4198	24.0	....
J	50	3031	27.0	3650
J	50	4320	28.0	....
J	50	4064	26.0	....
J	55	4198	23.0	....
J	55	3031	26.0	....
J	55	4320	27.0	....
J	55	4064	25.0	....

<b>22-250 (Varminter)</b>				
J	40	4320	40.0	4440
J	40	4320	41.0	4490
J	46	4227	38.5	1790
J	46	4227	40.0	1980
J	46	4227	42.5	2260
J	48	4320	40.0	4180
J	50	4198	45.0	2290
J	50	4198	48.0	2550
J	50	4198	22.0	3140
J	50	3031	22.5	3040
J	50	3031	27.5	3210
J	50	3031	35.0	3880
J	50	4320	35.0	3620
J	50	4320	36.0	3760
J	50	4320	37.0	3780
J	50	4320	39.0	4070
J	50	4320	40.0	4140
J	55	4320	35.0	3590
J	55	4320	36.0	3700
J	55	4320	37.0	3740
J	63	4064	37.0	3500
J	55	4350	39.5	....



Bullet	Grs. Weight	Powder Kind	Charge Grs.	Velocity
<b>218 Bee</b>				
Lead G. K.	43	Unique	4.5	1500
Lead G. K.	48	2400	9.5	1700
]	45	2400	13.5	2900
]	45	4198	15.0	2800
]	50	4227	13.5	2800
]	50	2400	12.5	2800
]	55	4198	14.0	2800

**22-3000 Lovell**

Lead G. K.	43	Unique	4.5	1500
Lead G. K.	46	Unique	4.5	1450
]	35	2400	14.0	3300
]	40	2400	14.0	3100
]	45	4198	15.8	3100
]	45	4227	15.8	3100
]	50	4198	15.0	3000
]	50	4227	15.0	3000
]	55	4227	14.0	2800
Lead G. K.	45	4759	7.0	1800
]	45	4759	8.0	1900

**R-2 Donaldson or R-2 Lovell**

Lead G. K.	43	Unique	4.5	1500
Lead G. K.	48	2400	4.5	1500
Lead G. K.	46	Unique	5.5	1700
Lead G. K.	46	2400	6.0	1500
Lead G. K.	43	4759	8.0	1900
]	45	4759	12.0	2500
]	40	4227	16.0	3400
]	45	4227	17.0	3300
]	50	4227	17.0	3200
]	50	4198	17.0	3200
]	55	4227	16.5	3050
]	50	4198	16.0	2950
Lead G. K.	47.5	4227	11.0	2490

**219 Zipper**

]	40	4198	25.5	3500
]	40	3031	29.5	3500
]	46	3031	28.0	3231
]	46	4064	29.0	3070
]	50	4198	22.5	3200
]	50	3031	28.0	3300
]	55	3031	26.5	3240
]	55	4064	27.0	2990
]	55	4320	27.5	3030
]	56	3031	25.5	2930
]	56	4064	26.5	2800

Bullet Weight and Style	DuPont No. 4227	Velocity	DuPont No. 4198	Velocity	DuPont No. 3031	Velocity	DuPont No. 4320	Velocity	DuPont No. 4064	Velocity
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**22 SAVAGE HIGH POWER**

70J	.....	.....	15.0	1890	21.0	2275	24.0	2350	.....	.....
	.....	.....	21.0	2605	27.0	2800	30.0	2830	.....	.....

**220 SWIFT**

48J	.....	.....	.....	.....	34.0	3500	35.0	3500	37.0	3600
	.....	.....	.....	.....	38.0	3885	38.8	3900	40.6	4025
55J	.....	.....	.....	.....	32.0	3310	33.5	3275	34.7	3360
	.....	.....	.....	.....	36.5	3635	37.5	3575	38.5	3685

**25-20 SINGLE SHOT**

86J	8.5	1400	.....	.....	.....	.....	.....	.....	.....	.....
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**25-20 REPEATER**

60J	9.7	1785	.....	.....	.....	.....	.....	.....	.....	.....
	12.7	2195	.....	.....	.....	.....	.....	.....	.....	.....
86J	8.7	1410	.....	.....	.....	.....	.....	.....	.....	.....
	10.7	1745	.....	.....	.....	.....	.....	.....	.....	.....

**25 REMINGTON RIMLESS**

87J	.....	.....	20.0	2325	26.0	2425	.....	.....	.....	.....
	.....	.....	23.5	2580	31.5	2755	.....	.....	.....	.....
117J	.....	.....	17.0	1800	21.5	1900	.....	.....	.....	.....
	.....	.....	22.0	2215	26.0	2225	.....	.....	.....	.....

**257 ROBERTS**

87J	.....	.....	29.0	2725	36.0	2820	38.5	2820	39.0	2860
	.....	.....	38.5	3020	40.5	3200	43.5	3200	43.5	3250
100J	.....	.....	28.0	2530	34.0	2625	35.5	2635	36.0	2680
	.....	.....	32.0	2785	38.5	2920	41.0	2950	41.0	2995
117J	.....	.....	26.0	2280	31.5	2400	33.5	2415	34.0	2455
	.....	.....	31.0	2580	36.0	2660	38.0	2675	38.0	2705



Bullet Weight and Style	DuPont No. 4227	Velocity	DuPont No. 4198	Velocity	DuPont No. 3031	Velocity	DuPont No. 4320	Velocity	DuPont No. 4064	Velocity
<b>25-35 WINCHESTER</b>										
87j	.....	.....	19.0	2260	25.0	2310	27.0	2370	.....	.....
	.....	.....	21.5	2560	30.0	2795	32.0	2730	.....	.....
100j	.....	.....	18.0	2110	23.0	2060	24.0	2100	.....	.....
	.....	.....	21.0	2365	27.0	2450	29.0	2465	.....	.....
117j	.....	.....	17.5	1930	21.0	1930	23.0	1950	.....	.....
	.....	.....	20.5	2210	26.5	2350	28.0	2295	.....	.....
<b>250 SAVAGE, BOLT ACTION</b>										
87j	.....	.....	24.0	2500	29.0	2600	32.0	2535	32.0	2600
	.....	.....	29.5	2970	36.5	3110	38.0	3030	38.0	3095
100j	.....	.....	23.0	2300	28.0	2420	30.0	2425	30.0	2360
	.....	.....	28.5	2720	34.0	2830	36.0	2820	36.5	2885
<b>270 WINCHESTER</b>										
100j	.....	.....	.....	.....	42.0	2930	.....	.....	.....	.....
	.....	.....	.....	.....	50.0	3250	54.0	3280	50.0	3250
130j	.....	.....	.....	.....	37.0	2545	42.0	2645	40.0	2565
	.....	.....	.....	.....	48.0	3051	52.0	3110	49.5	3090
<b>30 REMINGTON</b>										
110j	.....	.....	21.0	1980	32.0	2320	.....	.....	.....	.....
	.....	.....	25.0	2350	36.5	2550	.....	.....	.....	.....
160j	.....	.....	18.0	1550	24.0	1765	.....	.....	.....	.....
	.....	.....	22.5	1965	30.5	2140	.....	.....	.....	.....
170j	.....	.....	18.0	1595	23.0	1660	.....	.....	.....	.....
	.....	.....	22.0	1895	30.0	2070	.....	.....	.....	.....
<b>30 WINCHESTER (30-30)</b>										
113j	.....	.....	24.0	2185	30.0	2190	.....	.....	.....	.....
	.....	.....	32.5	2745	37.0	2630	.....	.....	.....	.....
150j	.....	.....	23.0	2000	29.0	2090	.....	.....	.....	.....
	.....	.....	27.0	2305	35.0	2500	.....	.....	.....	.....
170j	.....	.....	21.0	1835	28.0	1945	.....	.....	.....	.....
	.....	.....	26.0	2160	33.5	2300	.....	.....	.....	.....
<b>300 SAVAGE</b>										
110j	.....	.....	29.5	2365	40.0	2585	.....	.....	.....	.....
	.....	.....	40.0	3045	45.0	2915	.....	.....	.....	.....
150j	.....	.....	28.0	2150	37.0	2290	.....	.....	.....	.....
	.....	.....	35.5	2600	41.0	2565	.....	.....	.....	.....
180j	.....	.....	27.0	2075	34.0	2100	.....	.....	.....	.....
	.....	.....	34.0	2375	40.0	2450	.....	.....	.....	.....
<b>300 H. &amp; H. MAGNUM</b>										
180j	.....	.....	.....	.....	.....	.....	45.0	2485	.....	.....
	.....	.....	.....	.....	.....	.....	57.5	3000	.....	.....

Bullet Weight and Style	DuPont No. 4227	Velocity	DuPont No. 4198	Velocity	DuPont No. 3031	Velocity	DuPont No. 4320	Velocity	DuPont No. 4064	Velocity
<b>30-06 SPRINGFIELD*</b>										
110j	.....	.....	30.0	2330	43.0	2750	52.0	2900	49.0	2745
	.....	.....	45.5	3150	57.5	3310	60.5	3345	59.0	3285
150j	.....	.....	27.0	1985	45.0	2500	48.0	2600	46.0	2525
	.....	.....	43.0	2820	54.0	3060	57.5	3080	57.0	3070
173j	.....	.....	25.0	1830	40.0	2340	45.0	2480	43.0	2415
	.....	.....	39.5	2615	48.5	2800	51.0	2860	51.0	2820
180j	.....	.....	25.0	1760	40.0	2275	45.0	2415	43.0	2350
	.....	.....	39.0	2505	48.0	2685	50.5	2790	50.5	2750
220j	.....	.....	.....	.....	.....	.....	42.0	2115	41.0	2100
	.....	.....	.....	.....	.....	.....	49.0	2425	49.0	2400
*Frankford Arsenal primers used. When using regular commercial primers, reduce charges three to five grains.										
<b>30-40 Krag</b>										
110j	.....	.....	28.0	2370	37.0	2050	.....	.....	.....	.....
	.....	.....	37.0	2885	45.5	2715	.....	.....	.....	.....
150j	.....	.....	25.0	2050	35.0	1880	36.0	2365	40.0	2405
	.....	.....	30.0	2365	42.0	2665	44.0	2680	46.0	2770
173j	.....	.....	24.0	1915	32.0	2045	32.0	2005	34.0	2110
	.....	.....	27.5	2130	38.5	2470	40.0	2420	42.0	2565
180j	.....	.....	24.0	1895	32.0	2040	32.0	2000	34.0	2100
	.....	.....	27.0	2060	36.5	2345	38.5	2350	40.0	2425
220j	.....	.....	24.0	1765	31.0	1850	31.0	1815	33.0	1900
	.....	.....	26.7	1875	36.2	2090	38.2	2150	39.7	2200
<b>303 SAVAGE</b>										
190j	.....	.....	20.0	1498	30.0	1840	32.0	1850	.....	.....
	.....	.....	27.5	2000	33.5	2090	36.5	2145	.....	.....
<b>303 BRITISH</b>										
174j	.....	.....	.....	.....	37.0	2200	39.0	2155	38.0	2100
	.....	.....	.....	.....	42.0	2510	45.0	2515	43.0	2400
215j	.....	.....	.....	.....	36.0	2070	38.0	2050	38.5	2065
	.....	.....	.....	.....	40.0	2265	43.5	2340	42.5	2275
<b>32 REMINGTON RIMLESS</b>										
110j	.....	.....	20.0	2285	33.0	2245	.....	.....	.....	.....
	.....	.....	34.0	2730	38.0	2500	.....	.....	.....	.....
170j	.....	.....	21.0	1800	29.0	1930	.....	.....	.....	.....
	.....	.....	27.0	2130	34.0	2220	.....	.....	.....	.....
<b>32 WINCHESTER SPECIAL</b>										
110j	.....	.....	29.0	2400	32.0	2090	35.0	2185	.....	.....
	.....	.....	36.0	2825	37.0	2375	40.0	2415	.....	.....
170j	.....	.....	23.0	1870	28.0	1860	32.0	1915	.....	.....
	.....	.....	30.0	2260	33.5	2230	36.5	2180	.....	.....



Bullet Weight and Style	DuPont No. 4227	Velocity	DuPont No. 4198	Velocity	DuPont No. 3031	Velocity	DuPont No. 4320	Velocity	DuPont No. 4064	Velocity
32 WINCHESTER (32-20)										
80J	13.0 17.0	1710 2220								
115J	10.0 13.5	1400 1760								
32-40										
110J			20.5 24.0	1850 2230	28.0 33.0	2155 2245				
165J			17.0 21.5	1460 1870	24.0 28.0	1835 1955				
33 WINCHESTER										
200J			24.0 32.0	1650 2140	37.0 42.0	2050 2260	38.0 44.5	2000 2225	41.0 46.0	2010 2260
348 WINCHESTER										
150J			35.5 39.8	2365 2590	50.0 54.2	2600 2775	54.0 58.0	2640 2795	55.5 58.5	2700 2835
200J			34.5 38.0	2100 2275	43.0 49.0	2200 2450	46.0 52.0	2235 2470	48.5 53.6	2315 2535
35 REMINGTON										
150J			28.0 36.0	2050 2400	35.0 40.5	1970 2230				
200J			24.0 32.0	1700 2045	34.0 39.0	1870 2130				
35 WINCHESTER										
250J			30.0 37.0	1825 2105	40.0 49.0	1935 2320	43.0 51.5	1920 2250	44.0 50.0	1940 2190
375 H. & H. MAGNUM										
300J									56.0 63.0	2160 2450
38 WINCHESTER (38-40)										
130J	31.0	2130								
180J	28.0	1850								
38-55										
255J					30.0 35.0	1555 1820				
405 WINCHESTER										
300J					52.0 57.0	2040 2250	52.0 62.0	1905 2220		

Bullet Weight and Style	DuPont No. 4227	Velocity	DuPont No. 4198	Velocity	DuPont No. 3031	Velocity	DuPont No. 4320	Velocity	DuPont No. 4064	Velocity
44 WINCHESTER (44-40)										
200J	29.0	1890								
45-70 WINCHESTER H.V.										
300J					48.0 58.0	1675 2015				
45-90 WINCHESTER										
300J			57.0	2215	64.0	2040				
405J			53.0	1980	60.0	1950				
6mm U. S. NAVY										
112J									27.0 32.5	2200 2540
6.5mm MANNLICHER SCHOENAUER										
129J					32.5 37.5	2270 2580			35.0 40.5	2290 2600
140J					31.0 36.0	2140 2450			33.5 39.0	2160 2480
160J					29.0 33.5	1960 2220			32.0 37.0	1990 2260
7mm MAUSER										
139J					37.0 42.5	2590 2920	39.0 46.0	2600 3015	40.0 46.0	2625 3000
175J					33.0 40.0	2210 2530	35.0 42.0	2230 2580	36.0 42.0	2255 2575
7.62mm RUSSIAN										
110J					46.0 51.0	2000 3200	48.0 56.0	2860 3285	52.0	3000
150J					45.0 50.0	2735 3035	47.0 53.0	2705 3055	47.0 51.0	2715 2955
173J					40.0 45.5	2425 2750	41.0 48.5	2400 2800	42.0 48.0	2445 2695
220J					36.0 41.5	2055 2300	37.0 44.0	2085 2360	39.0 45.0	2100 2380
8mm (7.9) MAUSER										
154J			34.0 43.5	2460 2905	45.0 51.0	2665 2945	47.0 56.5	2660 3075		
170J					43.0 48.0	2385 2600				
227J			33.0 39.0	2070 2200	39.0 46.5	2125 2440	39.0 48.0	2190 2455	44.0 50.0	2240 2520
236J					34.0 45.5	1920 2390	38.0 46.5	1935 2385	41.0 49.0	2125 2450



## Table of Charges for Rifles, Featuring Reduced charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Do not use this table until you have read the Sections of this Handbook entitled "Gunpowders" (Page 25), "How to Develop the Powder Charge" (Page 30) and "Indications of Excessive Pressures" (Page 30)

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
<b>22 SAVAGE HIGH POWER</b>									
70	J	7.0 10.7	1550 2190	11.0 13.0	1745 1965	10.0 23.0	1390 2920	11.0 16.9	1920 2700
45	B. & M. 22945	.....	.....	2.4	1050	.....	.....	.....	.....
50	B. & M. 22950	7.5	1932	6.3	1350	.....	.....	12.0	2170
60	B. & M. 22960	6.5	1650	13.0	2100	16.0	1900	.....	.....
<b>25-20 SINGLE SHOT</b>									
86	J	4.5	1060	5.0 6.8	1300 1424	.....	.....	6.0 8.6	990 1515
62	B. & M. 25962	4.0	1380	7.0	1450	.....	.....	7.0	1355
84	B. & M. 25984	5.0	1450	8.0 9.5	1570 1680	.....	.....	.....	.....
85	B. & M. 25985	4.7	1480	6.5	1375	.....	.....	7.5	1640
90	B. & M. 25990	5.5	1400	7.5	1525	.....	.....	.....	.....
<b>25-20 REPEATER</b>									
60	J	5.5	1795	7.0	1630	11.0	1715	10.2	2120
86	J	3.5 4.9	950 1355	6.3 7.0	1410 1475	11.0 11.7	1387 1725	5.0 8.6	830 1710
62	B. & M. 25962	4.0 5.4	1475 1835	4.0 6.0	1150 1550	.....	.....	8.5	1850
84	B. & M. 25984	.....	.....	8.0	1570	.....	.....	8.7	1780
85	B. & M. 25985	4.8	1485	6.5	1375	.....	.....	.....	.....
90	B. & M. 25990	.....	.....	5.0 6.0	1175 1300	.....	.....	.....	.....

## Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
<b>25 REMINGTON RIMLESS</b>									
60	J-25-20	9.0 12.9	2020 2565	11.3 15.0	1850 2260	18.0 28.3	2140 3220	15.0 20.6	2370 3020
87	J	12.0	2080	12.0 15.5	1630 2020	19.7 24.6	2100 2605	21.9	2618
100	J	8.0	1400	9.5 13.0	1325 1800	.....	.....	.....	.....
117	J	7.0 10.6	970 1575	10.0 14.0	1240 1775	12.0 23.2	1290 2310	11.0 15.6	1440 1905
85	B. & M. 25985	.....	.....	6.5	1350	.....	.....	.....	.....
84	B. & M. 25984	5.0	1245	14.0	1800	17.0	1850	.....	.....
90	B. & M. 25990	.....	.....	6.0 10.0	1120 1520	.....	.....	.....	.....
<b>25-35 WINCHESTER</b>									
86	25-20 J	.....	.....	10.0 12.0	1425 1500	20.0	2401	.....	.....
87	J	6.0 9.0	1190 1780	10.0 13.5	1520 1945	10.0 21.4	1260 2415	12.0 14.8	1825 2155
117	J	7.0 8.0	1000 1150	13.0	1600	9.0 18.7	1020 1960	8.0 12.5	1220 1640
85	B. & M. 25985	7.0	1660	6.5	1150	.....	.....	.....	.....
84	B. & M. 25984	9.0	1750	14.0	1800	17.0	1850	.....	.....
90	B. & M. 25990	.....	.....	5.5 9.5	1075 1540	.....	.....	.....	.....
<b>250 SAVAGE</b>									
60	J 25-20	10.0 14.0	2205 2695	12.0 18.7	1760 2520	20.0 28.8	2465 3260	17.0 22.0	2620 3155
86	J 25-20	5.3 10.0	1040 1758	..... 14.0	..... 1810	.....	.....	.....	.....
87	J	6.8	1377	12.0 18.0	1600 2100	..... 29.9	..... 3000	.....	.....
100	J	12.6	1835	18.0	1900	26.0	2590	18.2	2225
117	J	12.0	1560	.....	.....	24.8	2350	17.1	2000
85	B. & M. 25985	.....	.....	6.5	1150	.....	.....	.....	.....



Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
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## 250 SAVAGE—Continued

84	B. & M. 25984	9.0	1750	14.0	1800				
90	B. & M. 25990			7.0	1185				
				11.0	1575				

## 256 NEWTON

129	J			18.0	1550	25.0	2000		
120	B. & M. 269120			12.0	1300				
125	B. & M. 269125	10.0	1500	18.0	1600				

## 270 WINCHESTER

130	J	13.0	1470	20.0	1675	22.0	1655	20.0	1825
		19.8	2005	23.0	1835	41.4	2890	29.4	2470
111	B. & M. 279111	8.0	1402	11.5	1400				
				14.0	1625	15.0	1400	10.0	1246
125	B. & M. 279125			12.0	1450				
		10.0	1460	15.0	1595	12.0	1184	8.0	1109

## 7mm MAUSER

139	J	16.9	1860	18.0	1600	37.0	2775	25.2	2300
175	J	16.5	1660	18.0	1350	34.5	2445		
138	B. & M. 288138	16.0	1945	9.0	1140	11.0	1220		
140	B. & M. 288140	9.0	1440	15.0	1530	24.0	2020	25.0	2400

30-30 WINCHESTER, MARLIN AND SAVAGE,  
30 REMINGTON RIMLESS

110	J	10.0	1735	12.0	1540				
		13.4	2085	18.0	2095	29.0	2600		
150	J	9.0	1360	10.0	1140	18.0	1500	14.0	1640
		11.9	1685	14.0	1500	27.7	2300	20.2	2145
170	J	8.0	1185	11.0	1175	15.0	1280	13.0	1445
		11.2	1485	15.0	1475	26.6	2165	18.8	1895
115	B. & M. 311115	11.0	1825	7.0	1150	13.0	1350		
150	B. & M. 311150	10.0	1615	12.0	1425	20.0	1740	19.2	2085

Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
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## 30-30 WINCHESTER, MARLIN AND SAVAGE

## 30 REMINGTON RIMLESS—Continued

193	B. & M. 311193			10.0	1175				
				13.0	1420				
169	B. & M. 311169	8.0	1320	17.0	1650	25.2	2165	12.0	1495
		10.9	1600					17.1	1935
168	B. & M. 311168	9.0	1390	11.0	1200				
165	B. & M. 311165			17.0	1650				

## 30-1906 SPRINGFIELD

80	J-32-20	21.4	2360	29.0	2700	45.2	3510	33.5	3335
110	J	15.0	1960	16.0	1650	28.0	2195	22.0	2230
	30-30	19.8	2320	26.6	2375	42.6	3125	32.2	2910
150	J	14.0	1640	18.0	1550	27.0	1960	24.0	2140
		19.5	2010	23.0	1940	40.8	2800	30.8	2540
170	J	14.0	1490	18.0	1350	25.0	1740	20.0	1760
	30-30	18.5	1765	20.0	1500	39.8	2595	28.8	2275
180	J	18.4	1840	18.0	1375	39.0	2625		
98	B. & M. 31198			8.0	1100				
150	B. & M. 311150			13.5	1410				
168	B. & M. 311168			12.0	1180				
				20.0	1695				
169	B. & M. 311169	12.0	1500	12.0	1185	20.0	1605	19.0	1800
		17.8	1890	20.0	1730	32.0	2225	28.6	2320
170	B. & M. 311170			12.0	1175				
				20.0	1710				
175	B. & M. 311175			10.0	1025				
190	B. & M. 311190			20.0	1600	25.0	1750		
193	B. & M. 311193	12.0	1355	12.0	1150				
				16.0	1425				



Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
30-40 Krag									
80	32-20 J	13.0 18.4	2215 2705	19.0 23.0	2080 2400	20.0 38.0	2030 3350	22.0 28.8	2595 3125
110	30-30, J	16.4	2205	18.0	1825	35.5	2930	25.4	2655
150	J	12.0 15.8	1565 1860	12.5 17.0	1130 1550	20.0 33.6	1600 2570	18.0 24.8	1885 2340
170	30-30 J	12.4	1550	17.0	1500	20.0 32.0	1560 2380	.....	.....
180	J	13.0	1560	17.0	1475	.....	.....	12.0	1345
190	303 Savage J	11.9	1350	.....	.....	21.0	1820	.....	.....
220	J	14.0	1315	17.0	1375	30.9	2060	21.4	1695
98	B. & M. 31198	8.0	1580	10.5	1365	.....	.....	15.0	1885
170	B. & M. 311170	.....	.....	10.5 16.5	1150 1590	.....	.....	.....	.....
193	B. & M. 311193	11.0	1410	10.5 13.5	1165 1365	.....	.....	13.0	1380
168	B. & M. 311168	.....	.....	16.5	1595	.....	.....	.....	.....
169	B. & M. 311169	11.0 14.8	1520 1815	12.5 17.0	1280 1570	15.0 30.0	1400 2300	15.0 22.8	1665 2220

## 7.62mm RUSSIAN

150	J	12.0 16.0	1560 1900	15.0 22.0	1280 1915	18.0 37.0	1365 2580	20.0 26.4	1920 2340
170	30-30, J	.....	.....	14.0 23.0	1210 1870	.....	.....	.....	.....
180	J or cast	10.0 15.0	1340 1615	13.0 23.0	1145 1835	.....	.....	.....	.....
220	J or cast	11.0 14.7	1100 1355	14.0 21.0	1120 1535	18.0 33.4	1160 2090	18.0 23.0	1440 1760
99	B. & M. 31499	.....	.....	8.0 12.0	1175 1550	.....	.....	.....	.....
172	B. & M. 311169	11.0 15.4	1430 1730	10.0 16.0	1170 1565	15.0 27.0	1255 1920	18.0 25.0	1760 2180

NOTE—For other low power loads, use those listed under 30-06 Springfield and 30-40 Krag.

Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
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## 303 BRITISH

174	J	.....	.....	16.0	1500	34.5	2443	.....	.....
215	J or cast	13.0	1500	15.0	1350	27.7	1860	19.0	1540

NOTE—For other low power loads, use those listed under 30-06 Springfield and 30-40 Krag.

## 300 SAVAGE

150	J	11.0 16.0	1475 1900	18.0 22.0	1755 2030	15.0 35.7	1260 2670	16.0 25.2	1640 2350
170	30-30, J	11.0 15.1	1455 1755	16.0 21.5	1450 1800	15.0 32.3	1190 2390	16.0 23.6	1570 2150

NOTE—For other low power loads, use those listed under 30-06 Springfield and 30-40 Krag.

## 303 SAVAGE

190	J	8.0 11.3	1012 1390	10.0 14.0	705 1250	12.0 25.8	900 1990	13.0 17.6	1335 1695
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NOTE—For other low power loads, use those listed under 30-30 Winchester and 30 Rem. Rimless.

## 32 WINCHESTER SPECIAL AND 32 REMINGTON RIMLESS

110	J	9.0 13.2	1550 1990	15.0 18.0	1775 2050	20.0 29.8	1720 2560	17.0 21.6	1980 2385
165	J	12.0	1580	12.0	1400	26.6	2115	19.2	1925
170	J	11.0	1425	15.0	1300	26.5	2020	18.9	1875

NOTE—For other low power loads, use those listed under 30-30 Winchester and 30 Rem. Rimless.

## 32 WINCHESTER (32-20) RIFLE

80	J	5.5 6.6	1540 1800	8.5 12.5	1600 1930	10.0 15.8	1200 1960	6.0 12.1	1010 1980
100	J or cast	4.5 6.0	1250 1560	6.9 11.5	1235 1700	9.0 14.3	1090 1830	8.0 10.7	1320 1770
115	J or cast	4.0 5.4	1000 1340	6.5 9.3	1215 1325	8.0 13.3	820 1540	7.0 10.1	1110 1610

## 32-40

165	J	6.0 8.5	880 1255	9.0 13.2	1107 1427	15.0 20.0	1300 1726	11.0 14.2	1255 1580
166	B. & M. 322163	.....	.....	7.0	1000	.....	.....	13.5	1610
169	B. & M. 322169	8.2	1380	16.0	1470	22.0	1800	.....	.....



Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
33 WINCHESTER									
200	J	15.8	1585	18.5	1600	36.6	2355	26.4	2140
190	B. & M. 340190	16.8	1885	17.1	1600	18.0	1440	20.0	1860
35 WINCHESTER									
250	J	17.7	1530	18.0	1350	22.0	1280	28.2	1935
220	B. & M. 359220	.....	.....	17.5	1395	33.0	1850	.....	.....
270	B. & M. 359266	.....	.....	18.0	1250	.....	.....	.....	.....
35 REMINGTON RIMLESS									
150	J	10.0	1505	15.0	1525	22.0	1660	20.0	1945
		13.9	1870	21.0	1925	32.8	2340	23.4	2215
200	J	9.0	1230	16.0	1400	18.0	1335	16.0	1535
		12.5	1530	20.0	1650	30.6	2040	21.0	1885
206	B. & M. 359200	8.0	1230	11.0	1170	.....	.....	15.0	1525
		12.3	1580	16.5	1560	18.0	1400	19.9	1870
38-40 RIFLE									
130	J	11.9	1860	19.0	1975	27.5	2000	20.6	2020
180	J	8.0	1300	12.5	1280	15.0	1000	13.0	1255
		10.2	1555	15.5	1400	23.7	1620	17.7	1690
185	B. & M. 403185	.....	.....	16.0	1112	20.0	1450	15.0	1515
38-55									
255	J	10.6	1255	16.2	1325	25.1	1680	16.9	1500
275	B. & M. 381275	.....	.....	11.0	1065	14.0	1060	12.0	1190
		9.9	1305	15.5	1325	18.0	1360	16.5	1540
405 WINCHESTER									
300	J or cast	16.0	1325	17.0	1140	22.0	1120	26.0	1620
		22.6	1705	26.5	1500	38.0	1800	34.8	2030
44 WINCHESTER (44-40) RIFLE									
200	J or cast	9.0	1285	13.7	1300	19.0	1220	14.0	1260
		11.3	1520	18.0	1625	24.2	1555	19.6	1680
45-70									
300	J	18.7	1685	25.0	1565	44.0	2125	34.0	2125
405	J	17.3	1472	17.0	1050	39.0	1760	30.2	1730
237	B. & M. 458237	15.0	1648	19.0	1115	.....	.....	.....	.....
		20.8	1972	29.0	1630	.....	.....	.....	.....
400	B. & M. 458400	.....	.....	21.0	1115	.....	.....	.....	.....
		.....	.....	27.0	1450	.....	.....	.....	.....

Table of Charges for Rifles, Featuring Reduced Charges for High Power Arms and Reduced and Full Power Charges for Other Rifles.

Bullet Weight	Style of Bullet	Hercules Unique	Velocity	DuPont No. 80	Velocity	Hercules Lightning	Velocity	Hercules Sharp-shooter	Velocity
45-90									
300	J	15.0	1370	27.4	1540	33.0	1570	23.0	1420
		19.7	1660	29.5	1620	45.0	2025	34.6	2035

### Loads Employing DuPont Sporting Rifle Powder No. 4759

Furnished through the courtesy of J. Bushnell Smith, Middlebury, Vt.

Caliber	Style of Bullet	Weight Bullet	Charge grs.	Velocity
22 Hornet.....	cast G C	43	7.5	1910
22-3000 Lovell R2.....	J	45	8.0	1900
	J	45	10.0	2160
	J	45	12.0	2500
22 Varminter.....	J	40	29.0	3993
	J	45	22.5	3320
	J	45	25.0	3610
	J	45	29.0	3750
	J	50	10.0	1830
	J	50	15.0	2412
	J	50	18.0	2675
	J	50	20.0	2820
	J	50	22.5	3245
	J	55	18.0	2651
219 Zipper.....	J	45	12.0	2260
	J	45	16.0	2820
	J	45	18.0	3026
	J	45	20.0	3345
	J	50	16.0	2655
	J	55	16.0	2852
220 Swift.....	J	50	18.0	2720
	J	55	25.0	3235
	J	55	16.0	2330
	J	55	18.0	2535
25-20 Rep.....	cast G C	65	9.0	1560
	cast G C	75	10.0	1770
	J	86	10.0	1620
250 Savage.....	cast G C	90	10.0	1260
	cast G C	90	13.0	1700
257 Roberts.....	cast G C	100	13.0	1550
	cast G C	75	15.0	1920
	cast G C	90	15.0	1880
	cast G C	90	17.0	2250
30-30 Win.....	cast G C	160	13.0	1450
	cast G C	160	15.0	1605
30-40.....	cast G C	150	15.0	1545
	cast G C	207	22.0	1815



### Loads Employing DuPont Sporting Rifle Powder No. 4759 (Continued)

30-06.....	cast G C	150	12.0	1110
	cast G C	169	15.0	1252
	cast G C	169	18.0	1432
	J	110	30.0	2372
	J	160	25.0	1868
32-20.....	J	80	12.0	1605
32 Spl.....	cast G C	125	13.0	1510
	J	170	13.0	1605
348 Win.....	cast G C	200	15.0	1175
	cast G C	200	20.0	1395
	cast G C	200	25.0	1635
44-40.....	J	200	25.0	1710

### Loads Employing DuPont IMR No. 4350

Caliber	Style of Bullet	Weight Bullet	Charge Grs.	Velocity
220 Swift.....	J	50	42.0	3900
	J	55	39.0	....
	J	55	42.0	3600
	J	65	40.0	3550
257 Roberts.....	J	60	43.5	....
	J	100	46.0	3000
	J	117	45.0	2950
	J	125	44.0	2800
250 Savage.....	J	100	38.5	2900
270 Winchester.....	J	130	60.0	3050
	J	150	54.0	2960
	J	160	53.0	2800
30-06.....	J	125	57.0	3000
	J	150	57.0	....
	J	172	56.0	2800
	J	180	56.0	2730
	J	220	56.0	....
30-40 Krag.....	J	115	49.2	2681
	J	190	45.0	2300
30 Newton.....	J	150	73.0	3297
	J	173	70.0	3195
	J	180	69.0	3247
300 H & H Magnum.....	J	150	66.0	3250
	J	173	65.0	3150
	J	180	65.0	3100
	J	200	65.0	2760
7 mm Mauser.....	J	145	47.0	2950
	J	160	48.0	2636
8 mm Mauser.....	J	170	47.0	....

### DuPont Pistol Powder, P-5066

This is a new Smokeless Powder which has been developed by E. I. DuPont de Nemours & Co., to replace DuPont Pistol No. 5 which has been discontinued. Since the manufacturers of gun powders no longer issue data applicable to the use of their products, we do not have specific loading information to include in this edition of the Belding & Mull Handbook.

However, of this powder (DuPont P-5066) the manufacturers have this to say: "The new Powder is designated as DuPont Smokeless Pistol Powder P-5066. This is a nitrocellulose powder suitable for use in the usual center-fire pistol and revolver cartridges. It requires approximately the same weight of charge and gives the same ballistics as Pistol No. 5 and is therefore an excellent substitute for the latter powder."

From the above, we could assume that the handloader could substitute DuPont P-5066 for any charge listed in this Handbook which calls for Pistol No. 5. However, as a safety precaution, we suggest that maximum charges of DuPont No. 5 be reduced 5% to 10% when this substitution is made. We will know more about this new powder as time goes on.

### DuPont IMR No. 4895

This is the current (August 1948) kind of powder being sold by the Director of Civilian Marksmanship to members of the National Rifle Association for use in rifles of the 30-06 class. It has been designated as similar to DuPont Nos. 4320 and 4064 but, of course, it is neither. Further, the various lots of IMR No. 4895 vary in performance and we have been informed this variation is very wide in some instances.

We have some data on this powder as used in the 30-06 cartridge with the 150 gr. jacketed bullet as follows:

Caliber 30-06.....	150 gr. Bullet	36.0 grs. IMR No. 4895	2000 f. s.
	150 gr. Bullet	45.2 grs. IMR No. 4895	2500 f. s.
	150 gr. Bullet	47.0 grs. IMR No. 4895	2620 f. s.
	150 gr. Bullet	48.9 grs. IMR No. 4895	2710 f. s.
	150 gr. Bullet	50.7 grs. IMR No. 4895	2800 f. s.
	150 gr. Bullet	52.5 grs. IMR No. 4895	2900 f. s.
	150 gr. Bullet	55.0 grs. IMR No. 4895	3060 f. s.
	150 gr. Bullet	58.0 grs. IMR No. 4895	3230 f. s.

Charges of DuPont IMR No. 4895 exceeding 53.0 grs. and used with the 150 grain weight bullet in caliber 30-06 arms should be approached with caution.

Another kind of gunpowder which will be frequently encountered by handloaders unloading factory ammunition of Winchester and Western makes is in the form of small grayish colored spheres. This is a product of the Olin Industries, of which Winchester Repeating Arms Company and Western Cartridge Company are divisions. So far as we know, none of this kind of powder has been offered for sale to handloaders and we have no loading data applicable to it.

## TABLE OF REVOLVER CHARGES

Do not use this table until you have read the Sections of this Handbook entitled "Gunpowder" (Page 25), "How to Develop the Powder Charge" (Page 30), and "Indications of Excessive Pressure" (Page 30).



Table of Revolver Charges

CALIBER	Bullet Wt.	Style of Bullet	Du- Pont No. 5	Velo- city	Du- Pont No. 6	Velo- city	Herc. Bulls- eye	Velo- city	Du- Pont No. 80	Velo- city	Herc. Unique	Velo- city
25 Colt Automatic...	50	M. C.	1.4	776	1.2	768	1.3	830	2.2	720	2.0	740
30 Luger (7.65 mm)...	93	M. C.	4.4	1170	3.4	1065			6.2	1000		
30 Mauser (7.63mm)	80	M. C.	5.0	1145								
32 Colt Automatic...	71	M. C.	2.6	905	2.1	890	1.5 2.2	700 925	4.0 4.5	805 931	2.0 3.4	585 985
32 Short Colt.....	80	Lead	2.0	732	1.5	800			3.0 3.8	665 767		
32 Long Colt.....	80	Lead	2.7	835	2.3	840			4.0 6.5	634 815		
32 S. & W. Long.....	99	B. & M. 31499	3.0	700					5.0	800		
	98	Lead	2.6	707	2.4	815	1.5 2.7	635 910	3.5 6.0	700 1000	3.0 4.3	735 1010
32 S. & W. Long.....	99	B. & M. 31499	2.6	707	2.0 2.4	735 830			3.5 4.0	700 800		
	80	M. C.	4.5 6.5	955 1275	3.5 4.2	945 1090	2.5 4.2	850 1180			4.0 5.9	875 1220
32 Winchester.....	100	Lead	5.0	998	3.0 3.6	850 970	2.5 3.6	740 965	7.0 10.7	790 1000	3.5 6.5	720 1065
(32-20)	100	B. & M. 312100	4.4 4.9 2.0	907 1000 620	2.7 3.5	825 986	2.5 3.0	740 840	9.5 3.5	995 680		

Table of Revolver Charges

CALIBER	Bullet Wt.	Style of Bullet	Du- Pont No. 5	Velo- city	Du- Pont No. 6	Velo- city	Herc. Bulls- eye	Velo- city	Du- Pont No. 80	Velo- city	Herc. Unique	Velo- city
32 Winchester.....	98	B. & M. 31198	4.5 4.8	903 948	2.7 3.5	810 925			9.5	1000		
(32-20)	115	M. C.	4.5 5.0	750 850	2.5 3.2	680 805	2.0 3.1	590 850	7.0	755	3.0 4.5	645 925
(Cont.)	115	B. & M. 312114	3.9 4.6	774 892	2.6 3.3	735 860	2.0 3.2	690 930	9.0	935	3.0 5.1	740 1080
357 Magnum	115	Lead					3.0 5.0	900 1240			5.5 7.4	1105 1425
	145	Lead					3.0 4.5	890 1155			4.5 6.8	990 1370
	146	B. & M. 359146					3.0 4.1	900 1110			4.5 6.2	1000 1265
	150	B. & M. 359165					2.5 4.2	740 1075			4.5 6.2	910 1170
	158	Lead					2.5 3.9	790 1035			4.0 6.0	910 1210
38 Colt Automatic...	130	M. C.	5.6	1135	4.6 4.7	1080 1110	2.5 5.0	690 1175	7.0 7.7	930 1000	4.0 7.7	755 1310
	158	Lead	4.0	880	3.8	945			6.0 6.6	875 975		
38 S. & W. ....	146	B. & M. 359146	3.8	796	2.2 2.8	640 760	2.0 3.0	580 800	5.9 7.0	816 900	3.0 4.7	590 895



Table of Revolver Charges

CALIBER	Bullet Wt.	Style of Bullet	Du- Pont No. 5	Velocity	Du- Pont No. 6	Velocity	Herc. Bulls-eye	Velocity	Du- Pont No. 80	Velocity	Herc. Unique	Velocity
38 S&W	160	Lead	3.6 5.0	750 990	2.9 3.7	735 875	2.0 3.0	660 850			2.5 4.5	590 930
	130	B. & M. 359130	4.0 5.3	868 1136	2.5 4.0	745 1030	1.5 3.7	550 1030	7.0 7.5	895 1000	3.5 4.5	770 910
	146	B. & M. 359146	4.0 5.0	804 990	2.5 3.5	715 885	1.5 3.5	550 960	7.0 8.0	830 1000	3.5 5.3	730 1030
	158	Lead	3.5 5.0	650 920	2.7 4.2	665 930	1.5 3.5	515 910	7.0 8.0	840 1000	3.5 5.4	720 1000
	160	B. & M. 359160	4.2 5.2	851 1018	3.0 3.8	785 910	2.0 3.0	660 850	7.5 8.0	898 950		
	150	B. & M. 359150	3.2 4.2	706 925	2.6 3.6	775 970	2.0 3.3	635 880			3.5 5.2	730 995
38 Colt Long	148	Lead	3.6	815	3.0 3.7	770 890			6.2 8.0	795 940		
	130	M. C.	8.0 11.0	1000 1310	7.0 8.0	1080 1140	5.5 7.4	930 1175			8.0 12.0	935 1320
38-40	180	Lead	8.0	950	6.0 7.0	800 945	4.0 5.9	735 960	11.0 14.5	700 1000	7.0 10.0	825 1105
	185	B. & M. 403185	7.5 8.5	871 1006	6.0 7.0	940 1025			12.0 14.0	855 1015		
41 Long Colt	195	Lead	4.3	727					7.0 9.5	737 953		
	246	Lead	5.6 6.9	720 830	4.4	685			8.0 10.0	625 840		
44 S. & W. Russian	260	B. & M. 429260	5.0	610	4.2	645						

Table of Revolver Charges

192	B. & M. 429200	6.0 7.0	858 980	5.2 6.0	875 965				9.5 10.5	865 960	6.0 9.0	750 1070
200	Lead	7.2	875			6.5	1010				9.9	1135
202	B. & M. 429205	6.5 8.0	869 1048	5.5 6.5	875 980	3.0 5.9	630 975		12.0 13.0	890 985	7.0 9.7	820 1135
235	B. & M. 429240	5.8 7.2	767 941	4.8 6.3	765 940	3.0 5.3	628 875		9.5 10.5	770 925	5.0 8.1	710 1005
246	Lead	6.0 7.5	751 950	5.1 5.9	770 850	3.0 5.1	540 810		8.0 9.5	656 800	5.5 7.9	660 960
236	B. & M. 429260	5.0	650	5.0 5.7	835 920				7.0 9.0	687 925	6.5 8.5	755 985
140	M. C.	9.0 11.0	875 1115	9.0 10.5	925 1095	6.0 9.3	960 1255				10.0 14.1	1030 1400
195	B. & M. 425205	9.2 11.5	790 945	7.0 8.0	900 1000	5.0 7.0	790 980		17.5 19.0	745 920	8.0 11.3	835 1130
200	Lead	9.2 11.5	925 1150	7.0 8.0	770 945	5.0 6.7	780 955		15.3 17.0	918 1000	7.0 11.1	640 1100
195	B. & M. 429205	9.2 11.5	790 945			5.0 7.0	790 980		15.3 12.0	918 750		
225	B. & M. 429260	7.0	750			6.0	885					
195	B. & M. 429200	9.2	790	6.6	845							
200	Lead	9.2 10.5	925 1050			5.0 7.8	785 1090				9.0 11.8	925 1165
205	B. & M. 454210	8.0 10.0	701 968	6.8 7.8	900 1000				13.5 15.0	810 925		
240	B. & M. 454250	7.5 9.5	770 942	6.1 7.1	820 925	5.0 6.8	780 950		13.0 15.0	795 920	8.0 10.7	860 1050
250	Lead	7.2 8.5	825 925	6.7 7.7	840 915	5.0 6.6	760 900		12.0 15.0	792 925	8.0 10.3	850 1030
260	B. & M. 454260	6.0 7.5	675 845	5.8 6.7	750 825	4.0 6.0	675 880		14.0 15.0	680 725	6.0 8.9	680 960



Table of Revolver Charges

CALIBER	Bullet wt.	Style of Bullet	Du- Pont No. 5	Velo- city	Du- Pont No. 6	Velo- city	Herc. Bulls-eye	Velo- city	Du- Pont No. 80	Velo- city	Herc. Unique	Velo- city
45 Automatic Colt Pistol	200	M. C.	6.6	905	5.5	950	5.2	885	10.5	900	8.1	960
	220	Lead	3.8 5.3	605 850	3.8 4.8	760 885						
	230	M. C.	4.0 5.5	565 850	3.2 5.1	620 870	3.0 4.8	530 810	8.0	800	5.0 7.5	555 880
	235	B. & M. 454235	4.0 5.1	634 803	3.7 4.7	760 885	3.0 4.7	640 870	6.0 7.5	610 755	5.5 7.2	765 940
	236	B. & M. 452236	4.0 4.9	596 757	3.9 4.9	785 905	3.0 4.5	650 845	6.0 7.5	605 775	5.0 7.0	695 905
	194	B. & M. 452195							8.5 11.0	765 986	5.5 7.1	820 975
455 Long Colt.....	195	B. & M. 451210	6.5 6.6	905 925	4.1 5.1	840 970	3.0 4.6	695 930	8.5			
	168	B. & M. 453200	2.8 3.8				2.3 4.0					
455 Webley.....	265	Lead	5.0 6.0	590 730								
	235	B. & M. 454235	3.5 4.5	610 775	3.2 3.8	670 775						
	265	Lead	4.2	675	3.7	720			8.5 10.0	685 710		

## Characteristics of Firearm Sights

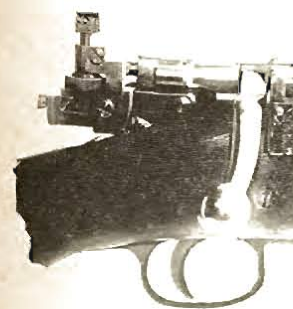
The individual will more readily understand the principle underlying the various designs of firearm sights if he will bear in mind one of the properties of the human eye, which is, that it is unable to focus simultaneously objects at different distances from it.

### The Open Sight



The open sight consists of a "V" or "U" shaped rear sight and a blade type front. All shooters are familiar with this type of sight, because they are furnished as standard sighting equipment on most of our firearms. While aiming, there are three objects at different distances from the eye which should be clearly seen at one time; the rear sight, front sight and target, only one of these, however, can be clearly defined at any given moment. Extremely accurate sighting is impossible because, when the eye is focused on the target, the front and rear sight will be out of focus and blurred. Open sights are satisfactory equipment for revolvers and are reasonably successful for use on rifles, when firing is to be done at short range and exceptional accuracy is of little importance.

### The Aperture or Peep Sight



The rear sight in this case consists of an assemblage, the essential part of which is a small circular aperture through which aim is taken. Centering the front sight and target in this opening is comparatively simple and, since the eye is not required to bring the circular aperture into focus, one of the objects that must be seen when the open sight is used is eliminated. The rear aperture prevents some of the side rays of light from striking the eye and produces what is known as an orthoptic effect which reduces the blurring of any object which is out of focus. Thus better definition of the front sight is obtained.

To take full advantage of the orthoptic principle of the aperture sight, it is desirable that the rear sight should be placed as near the eye as possible. This procedure is followed in the design of the B. & M. Bolt Sleeve Sight which is mounted on the sleeve of the bolt. The aperture sight permits a much more accurate aim than is possible with the open sight. It has, however, a decided disadvantage in that the field of view is severely reduced. Thus it is difficult to locate the target. Most sportsmen dispense with the use of the disc when using aperture sights in the game fields.



## The Telescope Sight



The Marksman

The Hunter

A properly designed and constructed Telescope Sight represents the ideal sighting equipment for rifles. In B. & M. Telescopes, parallel rays from the target pass through an objective lens and form at its focus an inverted real image of the target. Here is located the aiming point which may consist of a pointer, cross wire or other device. The inverted image is viewed by the firer through a system of two sets of lenses—the erector and the eye lens. The function of the erector is to make the image of the target appear in its natural position and the eye lens to magnify it. Almost any desired magnification can be had with this type of sight. Since the image of the target and the aiming post are both in the same focal plane, it follows that they are clearly defined when viewed by the firer. The target and surrounding area with the post or other type of graticule standing out sharp and black in the center, appear together as a large, bright, clearly defined picture. The eye of the shooter is not required to perform the impossible feat of seeing the rear sight, front sight and target at the same time. Neither does the eye have to be in an exact position behind the telescope to see this picture for there is an appreciable latitude of movement possible so that, when the gun is thrown to the shoulder, accurate sighting is simple, easy and practically instantaneous.

The above features constitute the outstanding advantage of the Telescope over "iron sights". The young, keen eye can, with appreciable strain and at the expense of time, line up iron sights reasonably well but the eye of the average man past forty is usually not equal to the task which becomes more and more difficult as the years increase. The Telescope Sight is a necessity for the shooter with defective vision who desires to retain his old time ability. It also so simplifies the task of sighting for the normal eye that no individual, who is desirous of improving his scores and bagging his game quickly and surely, can longer afford to be without the services of this type of sighting equipment.

The magnification of a Telescope Sight means that a target at 300 yards appears when viewed through a 3X glass as though it were (300/3) but 100 yards distant. Magnification alone, however, is relatively of less importance to the shooter than the light gathering or light transmitting qualities of the glass, the sharpness of definition, and the angle of view (field). B. & M. Telescopes are properly designed and of the highest optical quality. With them it is possible to continue accurate shooting at twilight and through fog when open sights would be worthless. Under these conditions and when the game is partially hidden behind brush and trees and nearly indistinguishable to the naked eye, the picture as seen through the Telescope, makes the quarry stand out clearly, brightly and well defined. The aiming post or other graticule appears jet black on this picture and your aim is, therefore, just as simple, easy and accurate as though sighting conditions were of the very best.

Glaring light and lateral rays of sunlight frequently make the proper aligning of open sights impossible. The Telescope eliminates these disturbing influences and accuracy of aim is not affected because the image of the graticule and target occupy the same position under all light conditions.

The vertical post or horizontal cross wire of the Telescope graticule largely obviates the tendency of the shooter to tilt or cant his arm. It is a natural reaction to line up these vertical or horizontal lines with some similar line in the field of view.

B. & M. manufacture a complete line of Telescope Sights and Mounts for hunting and target shooting purposes. They are widely known among shooters and acclaimed for the excellence of their optical qualities, design, construction and reliability. The choice of a Telescope is largely determined by the kind of shooting



Whitetailed deer as viewed at 100 yards using a  
3X Marksman Telescope Sight

to be done, which, for general purposes, may be divided into sporting and target shooting.

A Telescope for hunting purposes should be of 2½ to 3X magnification. Higher magnification is impractical and unnecessary. It should be of universal focus for, when game appears, there is no time to make focusing adjustments. Perhaps the most important requirement, however, is the size of the field of view. Other things being equal, the wider the field the better. The B. & M. 2½X Hunter and 3X Marksman are hunting type glasses and have a field of 42 feet per 100 yards of range which is ample for all sporting requirements. The focus of these glasses is universal and fixed. Objects are at all times sharply and clearly defined over ranges at which firing is practical. They provide brilliant illumination, unexcelled definition, and are entirely free from parallax. B. & M. Hunting Telescopes have an eye relief of three inches which is safe for use on the highest powered rifle. This eye relief is not critical. Aim can be satisfactorily taken and the target clearly viewed when the eye is at varying distances to the rear of the Telescope.

A Telescope is no better than its Mount. Shooters usually take exceptional care in the selection of a Telescope and frequently fail to recognize the importance of having it properly mounted. A Hunting Telescope Mount must be strong and rugged. It must be securely attached to the arm, yet easily removed.

The glass must be so held in the Mount that it is always in the aiming position. A Mount which allows the glass to slide with each shot is utterly unfit for hunting purposes.

The B. & M. Hunter Mount is absolutely rigid and fixed, yet readily detached from the gun. It is the ideal mount for the sportsman who rarely changes his sight adjustments. The B. & M. Marksman Telescope is mounted in the well known "Trussed Hunting" Mount which is exceptionally strong and rugged and is provided with easily and quickly manipulated adjustments for windage and elev.



ation. The Marksman is a really practical combination hunting and target Telescope Sight.

The B. & M. five, seven and nine power Target Telescopes are of the same high mechanical and optical excellence as the B. & M. Hunting glasses. They meet the highest requirements in light transmitting qualities of the glass, sharpness of definition and freedom of parallax. It is not practical for a Telescope of more than 3X to be universal in focus. B. & M. Target Telescopes are, therefore, of the focusing type. Proper focusing is a simple, rapid process. As magnification is increased the field of view is diminished so that the field of the B. & M. Target Telescopes, while of ample size for target purposes, is smaller than that of our hunting type. They are, however, very well adapted for small game and vermin shooting at all practical ranges.

B. & M. manufacture several types of high quality mounts designed especially for B. & M. Target Telescopes. All of these Mounts are made with precision, of the finest materials and provide easy and super-accurate adjustment in "minute of angle" or finer graduations for both windage and elevation.

We shall be glad to furnish upon request a special booklet containing a complete description of all B. & M. Hunting and Target Telescopes and Mounts.



Whitetailed deer as viewed at 100 yards over iron sights

## Instructions for Ordering

1. Write plainly or print your name and address. Always be certain that you have given your full name, street number, city and state before mailing your order.

2. When ordering Reloading Tools or Reloading Tool Parts always state the model and caliber of the arm for which the tool is desired, whether for solid (cast) or metal jacketed bullets, also the shape and design of the point of the bullet. Often a sample fired cartridge case and bullet forwarded with your order will avoid a delay in making shipment to you. Bullet Moulds and B. & M. Cast Bullets should be ordered by giving the number of the B. & M. Bullet design and the make, model and caliber of the arm to which the bullet is to be used. Orders for other B. & M. Products such as Bullet Puller Attachments, Loading Blocks, Loading Funnels, Stainless Steel Cleaning Rods etc., should always state the caliber desired. Jacketed Bullets should be ordered by Name and Caliber, Style and Weight; Primers by Brand, Number and Caliber.

3. There are times when, owing to delay in receiving factory shipments we are unable to fill orders for certain articles not of our own manufacture. This cannot be avoided. In cases of this kind we will ship all articles in stock and back-order the shortages, making shipment of the back-order (unless advised to the contrary) as soon as the goods are received.

4. Specify how goods are to be shipped. Reloading Tools or parts, Bullet, Moulds, Powder Measure, Cleaning Rods, Empty Unprimed Cartridge Cases, Bullets, etc. can be shipped by parcel post at the rates given on the following page.

Loaded Ammunition, Primers, Primed Cases and Smokeless Powder can be shipped only by express or freight.

**Smokeless Powder In Canisters May Be Shipped By Express.** (Ruling, Interstate Commerce Commission, December 10, 1935). The maximum amount that may be shipped in this manner in one outside package is 10-1 lb. cans and they must be packed in a wooden or fibre board box which conforms to I. C. C. Regulations.

**Black Powder and Smokeless** packed in larger than 1 lb. canisters can be shipped only by Freight.

## Terms

Unless credit has been established with us, our terms are cash in full with order or we will make shipment C.O.D. if 20% of the amount accompanies the order. All prices are F.O.B. Phillipsburg. If shipments are to be forwarded by parcel post include with your remittance an amount sufficient to cover postage and insurance.

The following table will assist you in determining the amount to remit when you desire to have your order sent by parcel post. It does not include insurance charges, which should be added as follows: on shipments having a value of \$25.00 or less add \$.05; over \$25.00 and up to \$50.00, \$.10; over \$50.00 and up to \$100.00 add \$.25.

The postage rate on packages weighing less than 8 oz. is as follows: for each 2 ounces or fraction thereof up to 8 ounces allow 2 cents. For packages weighing more than 8 ounces determine the shipping weight of the merchandise ordered. In the table, opposite the state to which the merchandise is to be sent, will be found the approximate postal charges. For example: suppose you wish to have shipped to Arizona merchandise having a shipping weight of 4 lbs. Arizona is found in the last group of states. Postage charges are \$.15 for the first pound, plus \$.11 for each additional pound or \$.12 plus \$.35 (4 lbs.-1 lb. x \$.11½) equals \$.53. All fractions of pounds are figured at one pound and all fractions of cents are figured at one cent.

	Wgt. over 8 oz. to 1 pound	Each add'l pound or fraction
Pennsylvania, Maryland, District of Columbia . . . . .	.12	.02
New York, New Jersey, Delaware, Virginia, West Virginia Ohio, Connecticut . . . . .	.13	.03
Rhode Island, Massachusetts, Vermont, New Hampshire, Maine, Michigan, Illinois, Indiana, Kentucky, Tennessee, North Carolina, South Carolina . . . . .	.14	.04½
Florida, Georgia, Alabama, Mississippi, Arkansas, Missouri, Iowa, Wisconsin, Minnesota . . . . .	.15	.06
North Dakota, South Dakota, Nebraska, Oklahoma, Texas, Louisiana, Kansas . . . . .	.16	.07½
New Mexico, Colorado, Utah, Wyoming, Montana . . . . .	.17	.09½
Washington, Oregon, Idaho, Nevada, California, Arizona and all U.S. possessions except Porto Rico and Virgin Islands . . . . .	.18	.11½
Canada . . . . .	.14	.14



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