987

HANDBOOK OF THE RIFLE

UNITED STATES RIFLE
CALIBER .30, MODEL OF 1903

PREPARED IN THE OFFICE OF
THE CHIEF OF ORDNANCE

October, 1919

(Revised)

(Original was Ordnance Document No. 1923)

WASHINGTON
GOVERNMENT PRINTING OFFICE
1920

WAR DEPARTMENT.
Document No. 987.
Office of The Adjutant General.

WAR DEPARTMENT,
WASHINGTON, *November 12, 1919.*

The following publication, entitled "Handbook of the Rifle, United States Rifle, Caliber .30, Model of 1903 (Revision of O. D. Pamphlet No. 1923)," is published for the information and guidance of all concerned.

[062.1, A. G. O.]

BY ORDER OF THE SECRETARY OF WAR:

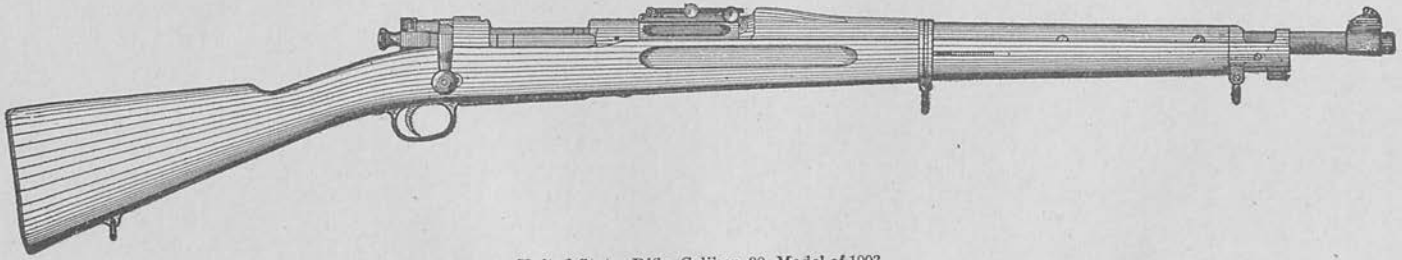
PEYTON C. MARCH,
General, Chief of Staff.

OFFICIAL:
P. C. HARRIS,
The Adjutant General.

Fig. 1.



Fig. 2.



United States Rifle, Caliber .30, Model of 1903.

UNITED STATES RIFLE,

CALIBER .30, MODEL OF 1903.

COMPONENT PARTS OF RIFLE.

(Ninety-five in number.)

- Barrel:
  - Barrel.
  - Base Pin.
  - Base Spline.
  - Fixed Base.
  - Fixed Stud.
  - Stud Pin.
- Bolt:
  - Bolt.
  - Extractor Collar.
- Bolt Stop:
  - Bolt Stop Pin.
  - Bolt Stop Spring.
- Butt Plate:
  - Butt Plate.
  - Butt Plate Cap.
  - Butt Plate Pin.
  - Butt Plate Screw, Large.
  - Butt Plate Screw, Small.
  - Butt Plate Spring.
  - Butt Plate Spring Screw.
- Butt Swivel:
  - Butt Swivel.
  - Butt Swivel Pin.
  - Butt Swivel Plate.
  - Butt Swivel Screws (2).
- Cut-off:
  - Cut-off.
  - Cut-off Plunger.
  - Cut-off Screw.
  - Cut-off Spindle.
  - Cut-off Spring.
- Ejector.
- Ejector Pin.
- Extractor.
- Firing Pin:
  - Cocking Piece.
  - Firing Pin Rod.
- Firing Pin Sleeve.
- Floor Plate.
- Floor Plate Catch.
- Floor Plate Pin.
- Floor Plate Spring.
- Follower.
- Front Sight:
  - Front Sight.
  - Front Sight Pin.
  - Front Sight Screw.
  - Movable Stud.
- Guard.
- Guard Screw Bushing.
- Guard Screw, Front.
- Guard Screw, Rear.
- Hand Guard.
- Hand Guard Clips (2).
- Lower Band.
- Lower Band Screw.
- Lower Band Spring.
- Lower Band Swivel.
- Magazine Spring.
- Mainspring.
- Rear Sight:
  - Base Spring.
  - Drift Slide, .05 Peep.
  - Drift Slide Pin.
  - Joint Pin.
  - Leaf.
  - Movable Base.
  - Slide.
  - Slide Binding Screw.
  - Slide Cap.
  - Slide Cap Pin.
  - Slide Cap Screw.
  - Windage Screw.
  - Windage Screw Collar.
  - Windage Screw Knob.

- Rear Sight—Continued.
  - Windage Screw Pin.
  - Windage Screw Spring.
- Receiver.
- Safety Lock:
  - Safety Lock Plunger.
  - Safety Lock Spindle.
  - Safety Lock Spring.
  - Safety Lock Thumb Piece.
- Sear.
- Sear Pin.
- Sear Spring.
- Sleeve:
  - Sleeve.
  - Sleeve Lock.
- Sleeve—Continued.
  - Sleeve Lock Pin.
  - Sleeve Lock Spring.
- Stacking Swivel.
- Stacking Swivel Screw.
- Stock.
- Stock Screw, Front.
- Stock Screw, Rear.
- Stock Screw Nut, Front.
- Stock Screw Nut, Rear.
- Striker.
- Trigger.
- Trigger Pin.
- Upper Band.
- Upper Band Screw.

APPENDAGES.

- Drift Slide No. 4.
- Drift Slide No. 6.
- Front Sight Cover.
- Oiler and Thong Case:
  - Oil Dropper.
  - Oiler Cap Washer.
  - Oiler Collar.
  - Thong Case Body.
  - Thong Case Cap.
- Oiler and Thong Case—Con.
  - Thong Case Pad.
  - Thong Case Partition.
- Thong:
  - Thong Cord.
  - Thong Tip.
  - Thong Weight.
- Thong Brush.
- Spare Part Container.

ACCESSORIES.

- Cleaning Rod, Barrack; Model of 1916:
  - Collar.
  - Knob.
  - Rod.
  - Sleeve.
- Cleaning Rod, Model of 1916:
  - Brush Section.
  - Handle Section.
  - Knob.
  - Collar.
- Cleaning Rod, Model of 1916—Continued.
  - Sleeve.
  - Second Section.
  - Third Section.
- Cleaning Rod Case.
- Screw-Driver:
  - Screw-Driver Blade, Large.
  - Screw-Driver Blade, Small.
  - Screw-Driver Pin.
  - Screw-Driver Rivet.

COMPONENT PARTS OF BAYONET, MODEL OF 1905.

(Twelve in number.)

- Bayonet Blade.
- Bayonet Catch.
- Bayonet Grip, Left.
- Bayonet Grip, Right.
- Bayonet Guard.
- Bayonet Nut.
- Bayonet Rivets (2).
- Bayonet Scabbard Catch.
- Bayonet Screw.
- Bayonet Spring.
- Bayonet Washer.

DESCRIPTION AND NOMENCLATURE OF RIFLE.

The Rifle is shown in Figs. 1 and 2.

The BARREL, with the FIXED STUD and FIXED BASE attached, is shown in Fig. 3. It is 24.006 inches in length, and the rifling consists of four plain grooves, 0.004 inch deep. The grooves are three times the width of the lands. The twist is uniform, one turn in 10 inches.

Fig. 3.



The muzzle is rounded to protect the rifling, and the tenon at the rear is threaded for the purpose of securing the receiver to the barrel.

On the top in rear of the fixed stud is stamped the Ordnance escutcheon, the initials of the place of manufacture, and the month and year. Those manufactured prior to 1906 are stamped "'05" without the month.

The removal from the barrel of the fixed stud, fixed base, or receiver should never be attempted except by competent workmen, in armories fully equipped with the necessary tools and appliances.

The RECEIVER, Fig. 4, top view, Fig. 5, right side view, and Fig. 6, front end view, has the hole A, called the *well*, which receives the bolt; the *magazine opening* B; the *channel* C, for the top locking lug; the *cut-off seat* D; the *cut-off thumb piece recess* E; *ejector pin hole* F; *clip slots* G; *cocking piece groove* H; *sear nose slot* I; *extracting cam* J; *sear pin hole* K; *gas escape hole* L; *recoil lug* M, in which is the hole for the front guard screw; the *recesses for the bolt locking lugs* N N; the *locking cams* O O; the *locking shoulders* P P; the *safety shoulder* Q; and the *cartridge ramp* R.

On the upper surface of the front end is stamped the serial number of the rifle and the place of manufacture.

The BOLT, Fig. 7, top view, Fig. 8, rear view, and Fig. 9, front view, has the *handle* A; the *locking lugs* B B, which sustain the shock of the discharge, the one on top being slotted to allow the passage of the point of the ejector; the *safety lug* C, which comes into play only in the event of the locking lugs yielding under powder pressure; the *extractor collar groove* D; *extracting cam* E; *sleeve clearance* F; *safety lock spindle notch* G; *sleeve lock notch* H; *firing pin hole* I; *cocking cam* J; *cock notch* K; *extractor tongue groove* L; *gas escape hole*, not shown in cut, between the locking lugs; the *rim* M; and *two small circular notches*, not shown in cut, on the left side of the slotted locking lug; this side of the lug rotates

90° when the bolt is drawn back for loading, and one of the notches engages with the *bolt stop pin* A, Fig. 10, in either single or magazine loading, retaining the bolt in place in the open position.

Fig.4.

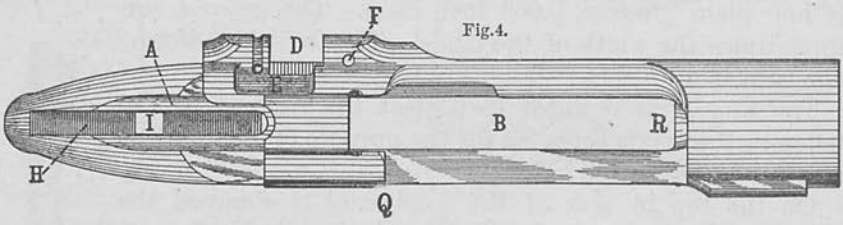
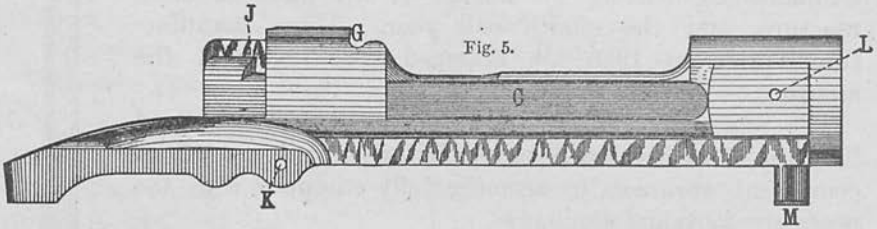


Fig. 5.



The Bolt Stop, Fig. 10, consists of the *pin* A and the flat *spring* B, riveted together in manufacture. The pin projects through its hole

Fig. 6.



Fig. 7.

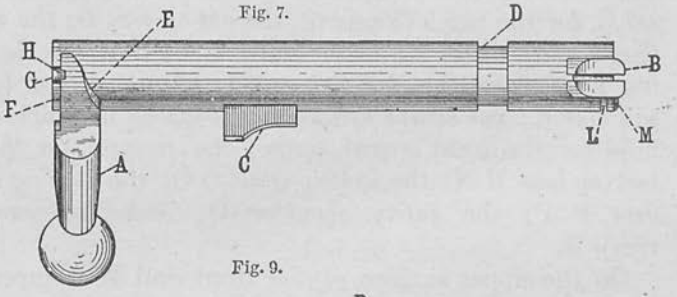


Fig. 9.

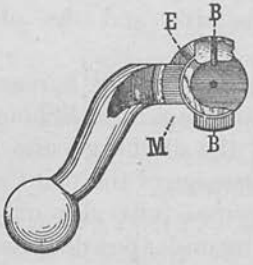


Fig. 8

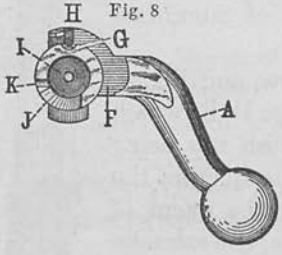
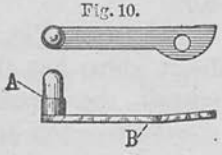


Fig. 10.



in the receiver just in front of the cut-off opening, and is held in place and operated by the spring which fits into a slot in the receiver in the rear of the magazine.

The SLEEVE, Fig. 11, top view, and Fig. 12, left side view, has the *barrel* A, which is threaded for the purpose of securing the sleeve to the bolt; the *safety lock seat* B; the *safety lock plunger groove* C; the *recesses* D, for retaining the safety lock when turned to the right or left; the *recess* E, for retaining safety lock in dismounting bolt mechanism; the *bevel* F, for dismounting the safety lock from the sleeve; the *sleeve lock recess* G; and the *sleeve lock pin hole* H. There are also the *safety lock spindle* and *firing pin holes*, the *cocking piece groove* and the *undercut* for the rear end of the bolt. None of the last four is shown in the cut.

Fig. 11.

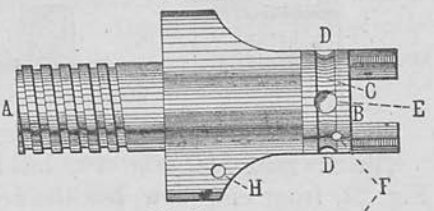
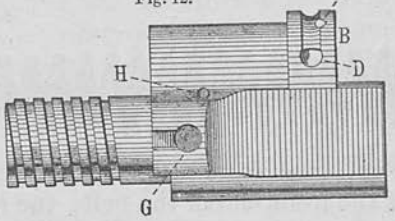


Fig. 12.



The SLEEVE LOCK, Fig. 13, left end view, and Fig. 14, under side view, has the *spindle* A, which is bored out to receive the sleeve lock spring; the *latch* B, and the *sleeve lock pin groove* C. It is designed to prevent accidental turning of the sleeve when the bolt is drawn back.

The SLEEVE LOCK SPRING and PIN are shown in Fig. 15.

The FIRING PIN, Fig. 16, consists of the *firing pin rod* A and the *cocking piece* B, which are made separately, the former being screwed into the latter and riveted in assembling; the length of the rod is so adjusted that when the front end of the cocking piece bears against the interior shoulder of the sleeve the striker point will project the proper distance beyond the face of the bolt. Other parts are the *knob* C, *lug* D, *cocking cam* E,

Fig. 13.



Fig. 14.

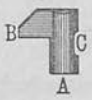
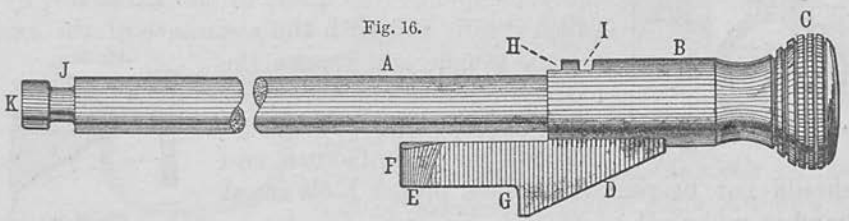


Fig. 15.



Fig. 16.



nose F, *sear notch* G, *locking shoulder* H, *locking groove* I, *neck* J, and *head* K.

The FIRING PIN SLEEVE, Fig. 17, sectional view, fits over the front end of the firing pin and the rear end of the striker, covering the joint hole, and preventing accidental separation of the firing pin and striker; its rear end forms the front bearing for the mainspring.

The STRIKER, Fig. 18, has the *point* A, the *body* B, the *shoulder* C, and the *joint hole* D, by which it is secured to the firing pin. The annular grooves on the striker retain the lubricating oil and prevent the accumulation of rust thereon.

Fig. 17.

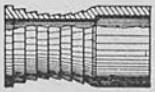
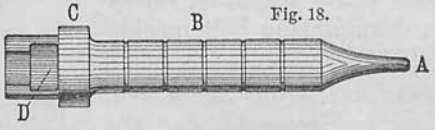


Fig. 18.



The MAINSPRING is shown in Fig. 19.

The EXTRACTOR, Fig. 20, inside view, Fig. 21, top view, and Fig. 22, front end view, has the *hook* A, by which the cartridge case

Fig. 19.



is extracted from the chamber; the *tongue* B, which rides in its groove at the front end of the bolt; the *lug* C C, which is undercut to receive

Fig. 20.

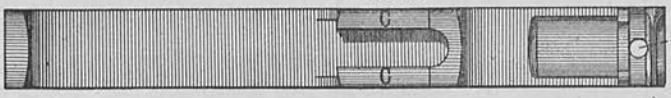


Fig. 21.

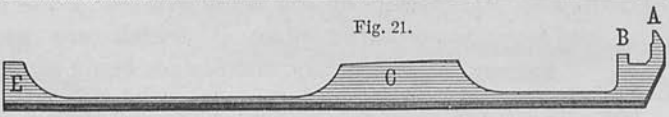


Fig. 22.



the ears on the lugs of the extractor collar; the *gas escape hole* D, and the *back rest* E, which is curved to fit the circle of the bolt.

Fig. 23.



Fig. 24.



The EXTRACTOR COLLAR, Fig. 23, end view, and Fig. 24, side view, has the *ears* A A, which fit in the undercuts on the inside of the extractor, by which means and with the assistance of the extractor tongue and groove the extractor is held in place. The collar is bent into position on the bolt in manufacture, and should not be removed unless proper tools are at hand to replace it.

Fig. 25.

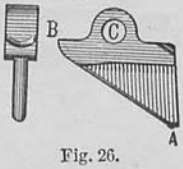
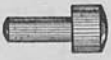


Fig. 26.



The EJECTOR, Fig. 25, has the *point* A, the *heel* B, and the *ejector pin hole* C. It is hinged on the ejector pin in its recess in the left side of the receiver, ejection being accomplished by the slotted lug on the bolt coming in contact with the heel when the bolt is drawn to the rear.

The head of the EJECTOR PIN, Fig. 26, is slotted for the purpose of providing sufficient tension to hold the pin in its place during the process of assembling.

The SAFETY LOCK, Fig. 27, rear and side views, consists of *thumb piece* A, the *spindle* B, *spring* C, and *plunger* D, assembled in manufacture. It has the *cam* E, the *locking groove* F, the *cocking piece groove* G, the *plunger hole* H, and the *bolt clearance* I. The spring and plunger are shown in Figs. 28 and 29, respectively; the latter, projecting into its groove in the sleeve, under the action of the spring, prevents any movement of the safety lock to the rear, and when in the recesses in the groove retains the safety lock turned either to the right or left or in the vertical position for dismounting bolt mechanism. The words "Safe" and "Ready" impressed on

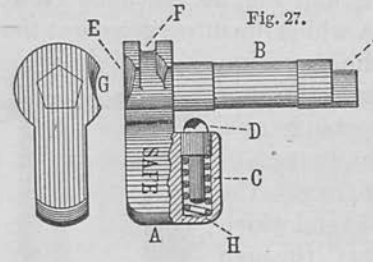


Fig. 27.

Fig. 28.



Fig. 29.



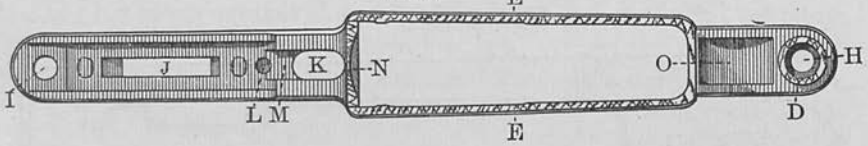


Fig. 30.

opposite sides of the thumb piece indicate that the firing mechanism is locked or ready for firing.

The GUARD, of which the body of the magazine forms a part, is shown in Fig. 30, top view, and Fig. 31, right side view. Its parts are:

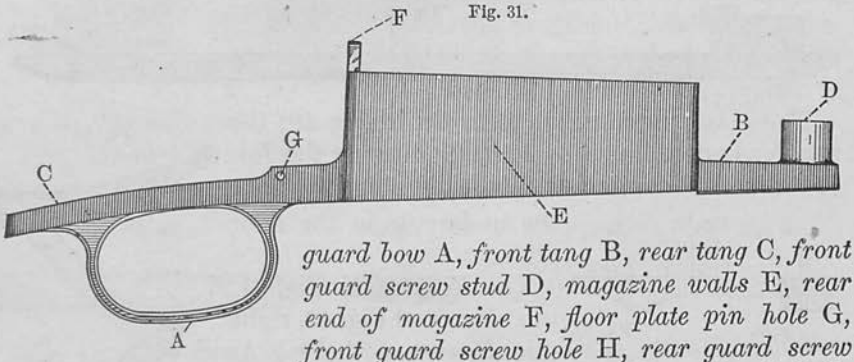


Fig. 31.

guard bow A, *front tang* B, *rear tang* C, *front guard screw stud* D, *magazine walls* E, *rear end of magazine* F, *floor plate pin hole* G, *front guard screw hole* H, *rear guard screw hole* I, *trigger slot* J, *floor plate lug slot* K, *floor plate spring hole* L, *floor plate catch slot* M, *ramp* N, and the *lightening cut* O.

The GUARD SCREW BUSHING, Fig. 32, fits tightly into the stock between the receiver and the rear tang of guard, and serves as a stop

for the screw, preventing its being screwed down tight enough to bend the guard.

The GUARD SCREWS, front and rear, Figs. 33 and 34, secure the guard to the receiver.

The FLOOR PLATE, Fig. 35, inside view, and Fig. 36, sectional view, has the *tenon* A, which fits into a groove at the front end of the magazine and with the assistance of the floor plate catch retains the floor plate securely in its place at the bottom of the magazine; the *lug* B, which is slotted to receive the floor plate catch and has a tenon on its front end which fits into a slot in the magazine; the *cavity* C, through which the floor plate catch is released by means of the end of a bullet; the *magazine spring recess* D, and the *magazine spring seat* E.

Fig. 32.

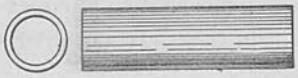
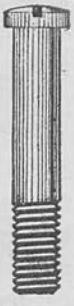


Fig. 33.



Fig. 34.



The FLOOR PLATE CATCH, Fig. 37, hinges on the FLOOR PLATE PIN, Fig. 38, and is operated by the FLOOR PLATE SPRING, Fig. 39. Its function is to retain the floor plate in its seat.

Fig. 35.

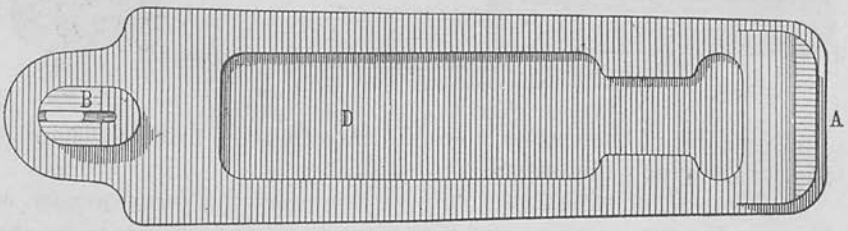
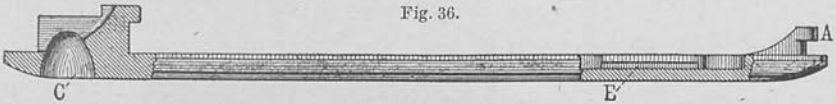


Fig. 36.



The MAGAZINE SPRING is shown in Fig. 40; the smaller end slides into the undercuts on the follower, and the larger end fits in the same way into the undercuts in the floor plate.

Fig. 40.

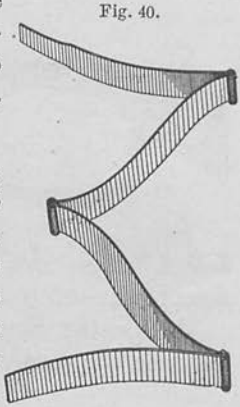


Fig. 37.

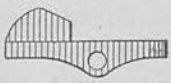


Fig. 38.



Fig. 39.



The FOLLOWER, Fig. 41, top view, and Fig. 42, right side view, has the *rib* A, which serves to locate the cartridges in the magazine and guides the last cartridge into the chamber; the *front stop for the magazine spring* B; the *rear stop for magazine spring* C; and the *lugs* D, in which are the undercuts for the magazine spring.

The CUT-OFF, Fig. 43, side view, Fig. 44, rear view, and Fig. 45, outer edge, has the *thumb piece* A, *body* B, *magazine fire groove* C, *dismounting groove* D, *cut-off spindle hole* E, *cut-off plunger hole* F, *cut-off screw hole* G, and the *serrature* H. The words on opposite sides of the thumb piece indicate to the firer whether the magazine is "on"

Fig. 41.

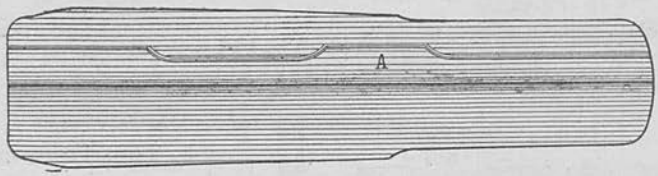
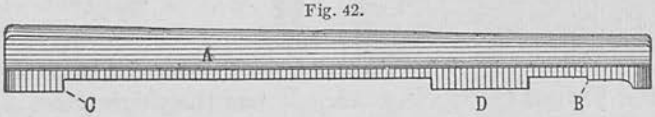


Fig. 42.



or "off." When the cut-off thumb piece is turned down, indicating "off," and the bolt is drawn to the rear, the rear end of the slotted locking lug stops against the projecting front end of the cut-off body. The piece is then ready for single loading. When the cut-off thumb piece is turned up, indicating "on," and the bolt is drawn to the rear, the rear end of the slotted locking lug stops against the shoulder at the rear end of the magazine fire groove. The piece is then ready for loading from the magazine. When the cut-off thumb piece is in the intermediate position, the *dismounting groove* D permits the bolt to be drawn entirely out of the receiver.

Fig. 43.

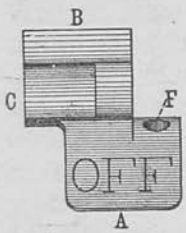
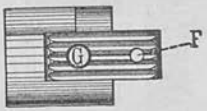


Fig. 44.



Fig. 45.



The CUT-OFF SPINDLE, Fig. 46, has the *cut-off screw groove* A and the *dismounting groove* B.

Fig. 46.



Fig. 47.



Fig. 48.



Fig. 49.



The CUT-OFF SCREW, Fig. 47, goes through the cut-off from the outer edge of the thumb piece, its end fitting into the groove in the cut-off spindle.

The CUT-OFF SPRING, Fig. 48, and the PLUNGER, Fig. 49, retain the cut-off in its seat in the receiver with the thumb piece turned up for loading from the magazine, down for single loading, or in the inter-

mediate position for permitting the removal of the bolt. The spindle head works in a groove in left side of receiver, having three small notches corresponding to the above positions of the cut-off.

The SEAR, Fig. 50, top view, and Fig. 51, right side view, has the *sear nose* A, *pin hole* B, *trigger slot* C, *trigger pin hole* D, and *sear spring seat* E, which is occupied by the SEAR SPRING, Fig. 52, its upper end bearing against the receiver.

Fig. 50.

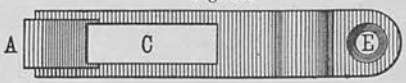


Fig. 52.

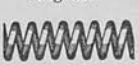


Fig. 51.

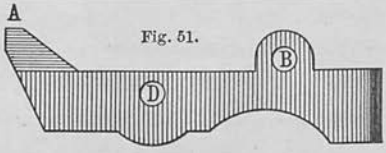


Fig. 53.



The SEAR PIN, Fig. 53, hinges the sear in the receiver.

The TRIGGER, Fig. 54, right side view, and Fig. 55, front view, is hinged in its slot in the sear by the TRIGGER PIN, Fig. 56. It has the *finger piece* A, which is knurled to prevent slipping of finger; the *bearing* B; *trigger pin hole* C; *heel* D; and the *stop* E.

The FRONT SIGHT, Fig. 57, is secured in its slot in the movable stud by the FRONT SIGHT PIN, Fig. 58; the pin is tapering, and its small end is driven in from the right and *the ends* upset to prevent accidental removal.

Fig. 54.

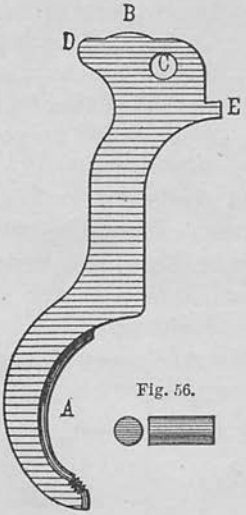


Fig. 55.



Fig. 57.



Fig. 58.



Fig. 56.

The FIXED STUD and MOVABLE STUD, with FRONT SIGHT in place, are shown assembled, Fig. 59, right side view,

Fig. 59.

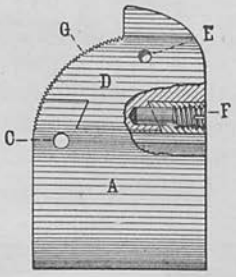
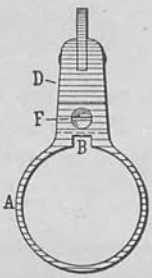


Fig. 60.



and Fig. 60, front view. The FIXED STUD A has a *slot* B, which, bearing on a lug on the upper side of the barrel, prevents lateral displacement of the stud; and *hole* C, for the STUD PIN, which prevents longitudinal displacement of the stud. The MOVABLE STUD D has the *front sight pin hole* E. It is held by the undercut slot in the fixed stud

and secured from lateral displacement by the FRONT SIGHT SCREW F. The recess for this screw is not drilled in the movable stud until the correct position of the movable stud has been determined. The *rear face* G, of both the fixed stud and movable stud is serrated to prevent any reflection of light from this surface interfering with the aiming.

Fig. 61.

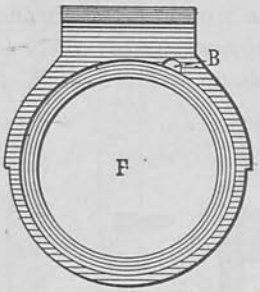
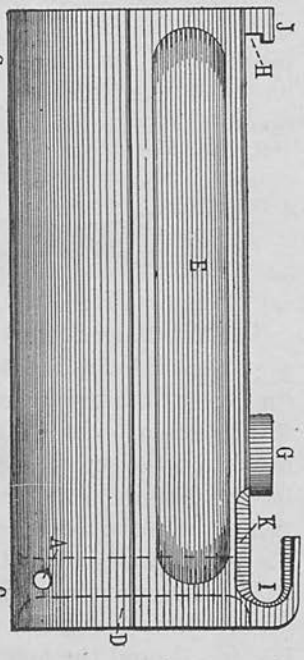


Fig. 62.



The FIXED BASE, Fig. 61, rear end view, and Fig. 62, right side view, has the *holes* A and B, for the base pin and base spline, respectively, by which it is firmly secured to the barrel and lateral and longitudinal movement prevented; the *undercut* D, for the tenon of the hand guard; the *lightening cuts* E; the *barrel hole* F; the *pivot lug* G, for the movable base; the *undercut* H, for the lip on the rear end of the movable base; the *undercut* I, for the windage screw and the lip on the front end of the movable base; the *lug* J, on the top of which are two zero marks for the wind gauge graduations, and the *chamfer* K, the seat for the windage screw collar. This chamfer is carried to the rear to permit of the assembling of the fixed base and the windage screw. On the left side of the front lug the chamfer corresponding to K is merely a conical recess for the head of the windage screw.

Fig. 63.

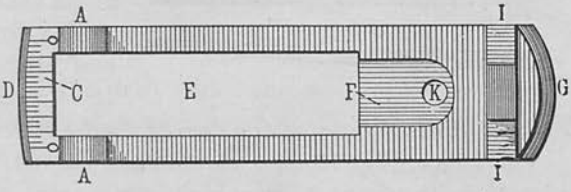
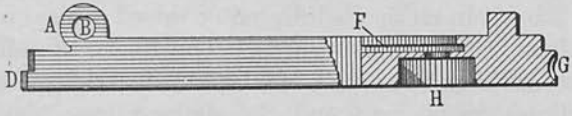


Fig. 64.



The BASE SPLINE locates and prevents the base from turning on the barrel.

The BASE PIN, similar to the base spline, prevents longitudinal movement of the base on the barrel.

The MOVABLE BASE, Fig. 63, top view, and Fig. 64, right side view, has the *ears* A, in which are the *holes* B, for the joint pin, which serves

as a hinge for the leaf; the *wind gauge graduations* C, each point of which corresponds to a lateral deviation of 4 inches for each 100 yards; the *lip* D, which fits in the undercut in the rear end of the fixed base; the *spring opening* E; the *spring seat* F, which is undercut to admit the lip on the front end of the base spring; the *lip* G, in which is a worm gear for the engagement of the windage screw; the *pivot hole* H, for the pivot lug on the fixed base, and the *shoulders* I, on which the front end of the leaf rests when down. The *hole* K is made for convenience in manufacture.

Fig. 65. Fig. 66. Fig. 67. Fig. 68. Fig. 69.



The WINDAGE SCREW consists of the *screw, collar, spring, knob,* and *pin,* Figs. 65, 66, 67, 68, and 69, respectively. The taper head of the screw fits into the conical recess in the left side, and the taper of the collar into the chamfer in the right side of the fixed base; the thread on the screw engages the worm gear in the lip of the movable base. Under the action of the spring, lost motion due to wear is prevented between the windage screw and the movable base and between the windage screw and the front lug of the fixed base.

The BASE SPRING, Fig. 70, top view, and Fig. 71, side view, has the *lip* A, which fits in the undercut in its seat in the movable base; the *free end* B, and the *hole* C, by which, with the aid of a drift made for the purpose, the spring is assembled or dismounted by driving it into or out of its seat in the movable base.

Fig. 70.



Fig. 71.

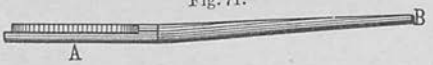


Fig. 72.



The JOINT PIN, on which the leaf hinges, is shown in Fig. 72. It is cylindrical, with rounded ends, and fits tightly in the ears of the base.

The LEAF, Fig. 73, top view (when down), and Fig. 74, right side view, has the *joint* A, in which is the *joint pin hole;* the *rib* B; the *undercut* C, for the drift slide, and the *sighting notch* D. The free end of the base spring bears against the lower end of the leaf and maintains it in either its lowered or raised position. The leaf is graduated from 100 to 2,850 yards. The lines extending across one or both branches of the leaf are 100-yard divisions, the longer of the short lines are 50-yard and the shorter lines 25-yard divisions.

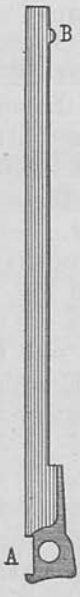
The DRIFT SLIDE, .05 PEEP, Fig. 75, top view (leaf down), has the *peephole* A, 0.05 inch in diameter; the *field view* B; the *drift slide pin* C,

riveted to the slide in manufacture, and the *notches* D. The lines on either side of the peephole and lower notch enable the drift slide to be accurately set at any desired graduation on the leaf.

Fig. 73.



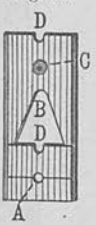
Fig. 74.



As the slide is moved up or down on the leaf the drift slide moves with it and at the same time has a lateral movement in the undercut between the branches of the leaf, thus automatically correcting for drift. This movement corrects for all drift up to 600 yards, but for only part of the drift beyond that range.

With the leaf up, ranges from 100 to 2,350 yards can be obtained through the peephole; from 100 to 2,450 yards through the lower notch at the bottom of field view; and from 1,400 to 2,750 yards through the upper notch in the upper edge of the drift slide.

Fig. 75.



The 2,850-yard range is obtained through the sighting notch in the upper end of the leaf.

With the leaf down and using the battle sight notch in slide cap the sights are set for 547 yards or battle line firing for the down position of the slide.

The SLIDE, Fig. 76, top view (leaf down), Fig. 77, front view (leaf down), and Fig. 78, right end view, has the *leaf slot* A; the *clearance*

Fig. 76.

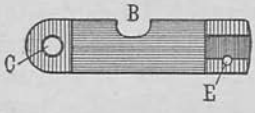


Fig. 77.

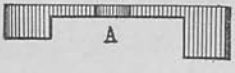


Fig. 78.



B, for the open notch in the drift slide; the *slide cap screw hole* C; *slide binding screw hole* D; *slide cap pin hole* E, and the *dovetailed groove* F, for the slide cap.

Fig. 79.

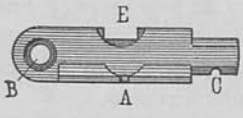


Fig. 80.

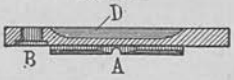


Fig. 81.



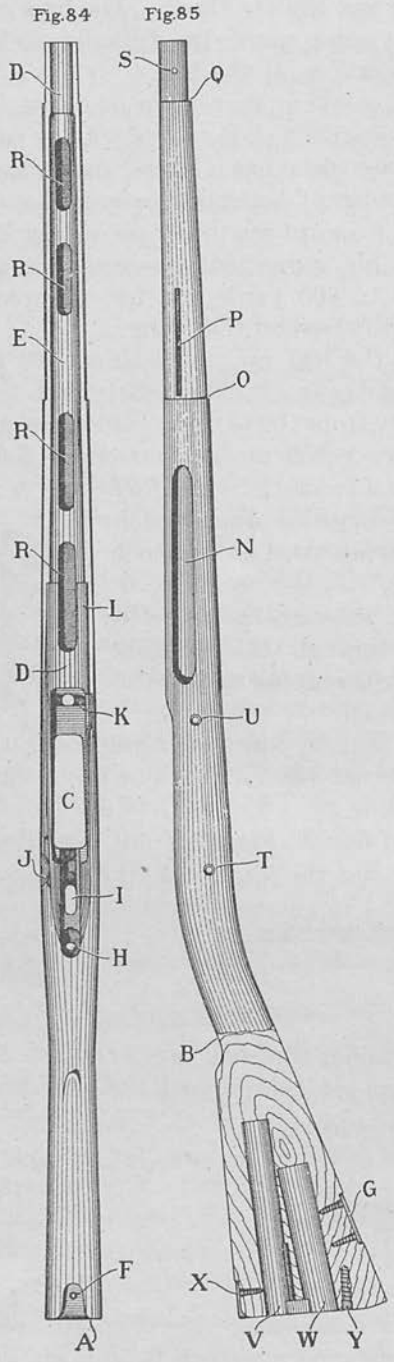
Fig. 82.



Fig. 83.



The SLIDE CAP, Fig. 79, top view (leaf down), and Fig. 80, cross section, has the *battle sight notch* A, *slide cap screw hole* B, *slide cap pin hole* C, the *groove* D, for the drift slide pin; and the *clearance* E, for the upper notch in the drift slide.



The cap is attached to the slide by entering the dovetailed groove at the right and by the slide cap screw at the left, thus securing the slide to the leaf.

The SLIDE CAP SCREW is shown in Fig. 81.

The SLIDE CAP PIN, Fig. 82, is inserted in the *pin hole* E, in the slide, Fig. 76, and fitting into a groove in the SLIDE BINDING SCREW, Fig. 83, prevents the accidental removal of the latter.

The STOCK is shown in Fig. 84, top view, and Fig. 85, right side view. The parts are the *butt* A; *small* B; *magazine well* C; *barrel bed* D; *air chamber* E, which reduces the charring effect of a heated barrel on the stock; *hole for butt plate screw, small* X, and *seat for the butt plate tang* F; *hole for butt plate screw large* Y; *butt swivel plate seat* G; *mortise for receiver tang lug* and *hole for rear guard screw* H; *mortise for sear* and *slot for trigger* I; *cut-off thumb piece recess* J; *mortise for recoil lug on receiver* K; *bed for fixed base* L; *grasping grooves* N; *shoulder for lower band* O; *bed for lower band spring* P; *shoulder for upper band* Q; *channels for decreasing weight* R; *upper band screw hole* S; the *rear stock screw hole* T; and the *front stock screw hole* U. The large hole W in the butt is for decreasing weight, and the smaller one V is a pocket for the combination oiler and thong case or spare part container.

The initials of the inspector and the year of fabrication are stamped on the left side in the rear of the cut-off thumb piece recess.

The HAND GUARD, Fig. 86, right side, and Fig. 87, bottom or inner surface, has the *swell* A, for the protection of the rear sight; the *shoulder* B, *for the lower band;* the *shoulder* C, *for the upper band;* the *rear tenon* D, which enters the under-

cut in the fixed base; the *front tenon* E, which enters the undercut in the upper band; the *clearance* F, *for the windage screw knob; air chamber* H, and *recess* I, *for the* HAND GUARD CLIPS which are shown

Fig. 86.

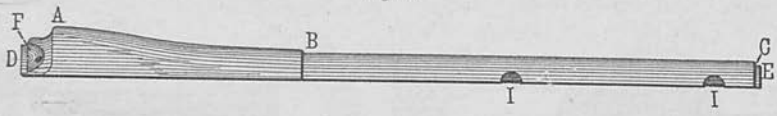


Fig. 87.

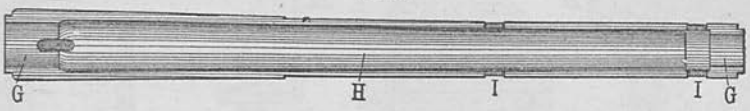
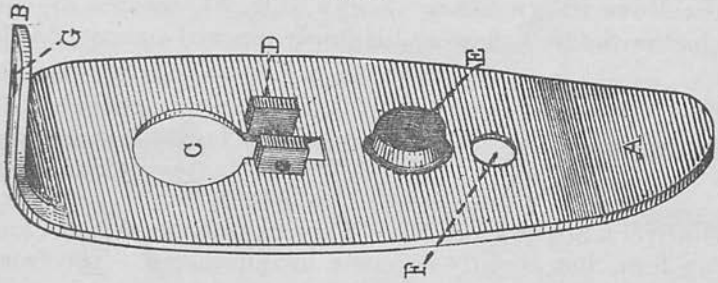


Fig. 88.



in Fig. 88. The hole shown in the cut near the rear end of the inner surface is made for convenience in manufacture. At the *swell* A a groove is cut for sight clearance.

Fig. 89.



The BUTT PLATE is represented in Fig. 89 and Fig. 90. The parts are *toe* A; *tang* B; *cap hole* C; *cap ears* D, through which are the *pin holes; spring lug* E; *hole for butt plate screw, large,* F; and *hole for butt*

Fig. 90.

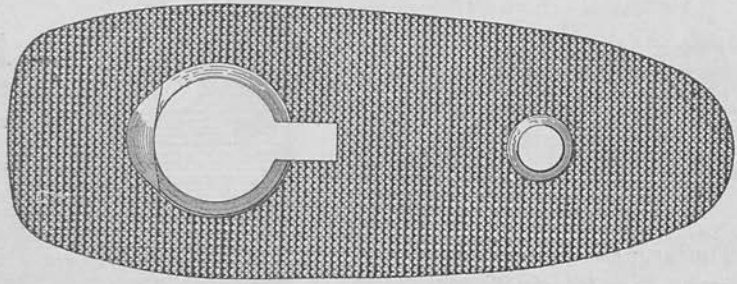


plate screw, small, G. A notch is cut into the edge of the cap hole to facilitate the opening of the cap. For this purpose the flange of the head of a cartridge case can be used. The butt plate is checked for the purpose of insuring a firm seat at the shoulder in firing.

The Butt Plate Cap, Fig. 91, Fig. 92, and Fig. 93, has the *pin hole* A and the *thumb notch* B. The cap is hinged between the ears of the butt plate on the butt plate pin and is retained either closed or open by the free end of the Butt Plate Spring, Fig. 96, which bears

Fig. 91.

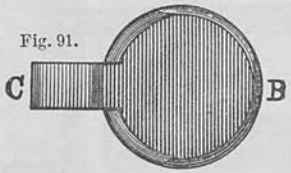


Fig. 92.

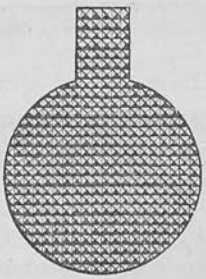


Fig. 93.



Fig. 96.

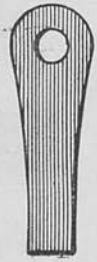


Fig. 95.



Fig. 94.



on the *heel* C. The cap is checked to match with the butt plate.

The Butt Plate Pin, Fig. 95, after being driven into the holes in the ears of the butt plate and cap, has its ends slightly upset.

The Butt Plate Spring Screw, Fig. 94, secures the spring to the lug on the butt plate and is firmly screwed against the spring.

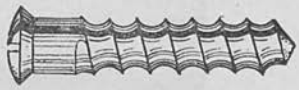
Fig. 97.



Fig. 98.



Fig. 99.



The Stock Screws and Nuts, Front and Rear, Fig. 97, are identical in form but slightly different in dimensions. The front stock screw extends transversely through the stock between the mortise for recoil lug and magazine well, and the rear stock screw extends transversely through the stock between the magazine well and the slot for trigger. The nuts and the heads of the screws are countersunk in the stock and the ends of the screws are slightly upset over the nuts.

Fig. 100.

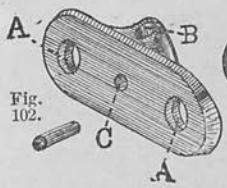


Fig. 102.

Fig. 101.

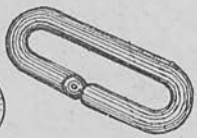
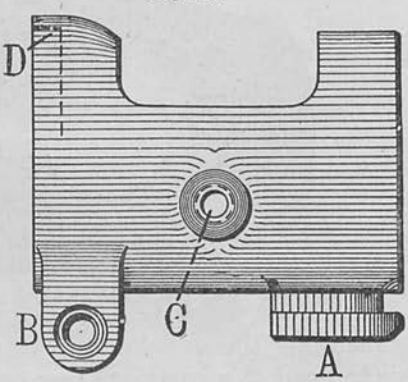


Fig. 103.



The large and small Butt Plate Screws, Figs. 98 and 99, secure the butt plate to the stock.

The Butt Swivel includes the plate, swivel, and pin assembled.

The Butt Swivel Plate, Fig. 100, has the *holes* A for the swivel screws; B for the swivel, and C for the swivel pin.

The Butt Swivel, Fig. 101, is retained in the plate by the Butt Swivel Pin, Fig. 102.

The BUTT SWIVEL SCREWS are the same as the butt plate screw small (see Fig. 98).

The UPPER BAND, Fig. 103, has the *bayonet lug* A; the *ears* B, in which are the holes for the stacking swivel screw; the *upper band screw hole* C, and the *undercut* D, for the front tenon on the hand guard.

Fig. 104.

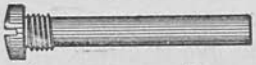


Fig. 105.

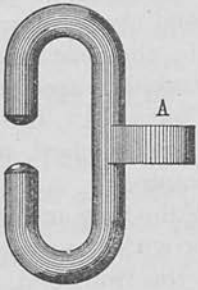


Fig. 106.

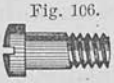
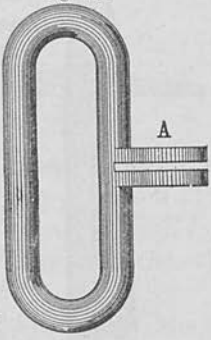


Fig. 107.



The UPPER BAND SCREW, Fig. 104, secures the band to the stock, the thread under the head engaging the hole in right side of the band.

The STACKING SWIVEL, Fig. 105, is hinged by the *lug* A between the *ears* B, of the upper band, on the STACKING SWIVEL SCREW, which is like the screw shown in Fig. 106, but slightly longer. The threaded end of the screw is upset, after assembling, to prevent its being lost.

The LOWER BAND SWIVEL, Fig. 107, is hinged by its *lug* A, between the ears of the lower band, on the LOWER BAND SCREW, Fig. 106. The threaded end of the screw is upset when in place.

Fig. 108.

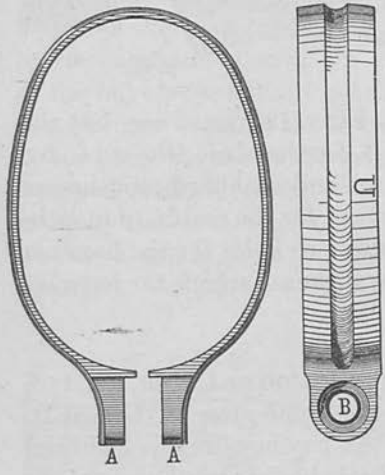
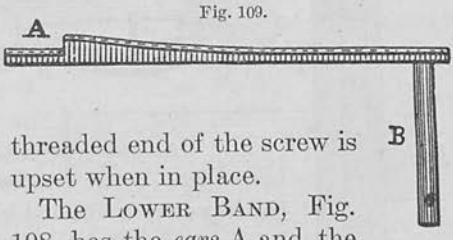


Fig. 109.



The LOWER BAND, Fig. 108, has the *ears* A and the *screw holes* B; the front or upper end is designated by the letter "U." The lower band and swivel are split between the ears in order to give better adjustment to the stock and hand guard and permit removal of the band without marring the stock.

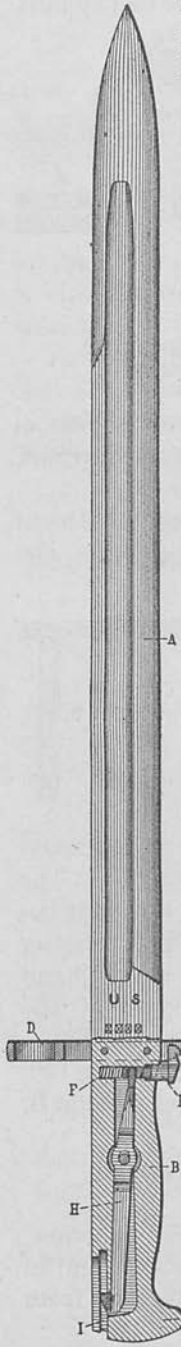
The LOWER BAND SPRING, Fig. 109, has the *notch* A, which holds the band in place, and the *spindle* B, which retains the spring in the stock.

THE BAYONET, MODEL OF 1905, AND BAYONET SCABBARD.

The BAYONET, Model of 1905, is shown in Fig. 110, right side view, with guard and tang, cross-sectioned, and right grip removed, and in Fig. 111, upper or back view, with blade cut off a short distance from the guard.

The *blade* A, the *tang* B, and the *pommel* C are forged in one piece; the front or lower edge is sharp along its entire length and the back for a distance of 5 inches from the point.

Fig. 110.



The blade is stamped on its left side with the ordnance escutcheon and the initials of the place and year of manufacture, and on the right side with the letters "U. S." and the serial number.

Immediately in the rear of the *guard* D the tang swells and is recessed to receive the *scabbard catch* E and the *bayonet spring* F. The swell in the tang also serves as a seat for the guard, which is riveted to the blade in manufacture.

The opening in the tang and pommel for the *bayonet catch* H connects with the recess in the swell of the tang and allows the front end of the bayonet catch to enter its seat in the bayonet scabbard catch. The *undercut groove* I receives the stud on the upper band when the bayonet is fixed, the bayonet being held in place by the bayonet catch projecting through the *hole* K.

Fig. 112.

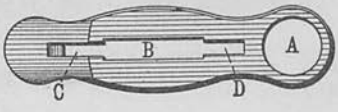


Fig. 113.

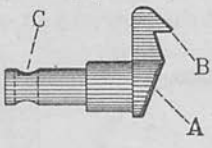
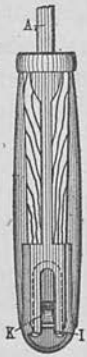


Fig. 114.



The BAYONET GUARD, Fig. 112, rear view, has the *barrel hole* A; the *mortise* B, for the blade; the *cut* C, for the bayonet scabbard catch and scabbard mouthpiece hook; and the *clearance cut* D, for the scabbard mouthpiece hook. There are also two holes for the bayonet rivets not shown in cut, by means of which the bayonet guard is riveted to the blade.

Fig. 111.



The BAYONET SCABBARD CATCH, Fig. 113, side view, has the *thumb piece* A; the *hook* B, which retains the bayonet in the scabbard by engaging the scabbard mouthpiece hook; and the *hole* C, which receives the point of the bayonet catch.

The BAYONET SPRING is shown in Fig. 114.

The BAYONET CATCH, Fig. 115, side view, has the *point* A; the *hole* B, which is a clearance for the bayonet screw; and the *hook* C, which, projecting from the *hole* K, in the

pommel, engages the bayonet lug on the upper band and retains the bayonet in its place on the rifle.

The BAYONET GRIP, RIGHT, outside view, is shown in Fig. 118. The hole is counterbored to receive the BAYONET WASHER, Fig. 119. A corresponding hole in the left grip is counterbored to receive the BAYONET NUT, Fig. 120. The washer in the right grip receives the head, and the nut in the left grip receives the thread of the BAYONET SCREW, Fig. 121, by means of which the grips are attached to the tang of the bayonet. The inner surfaces of the BAYONET GRIPS, RIGHT and LEFT, are shown in Figs. 117 and 116, respectively; there are the *clearance cuts*, A for the *bayonet catch*, B for the shoulder on the *pommel*, C for the swell of the tang, and the *hole* D for the bayonet screw.

Fig. 115.

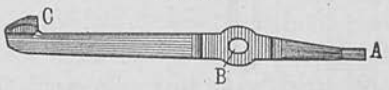
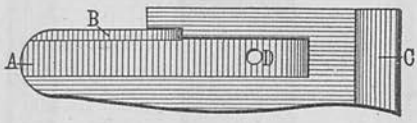


Fig. 116.



The BAYONET SCABBARD, Model of 1905, Fig. 122, side view and edge view, and Fig. 123, cross section of upper end, has the *wooden body* A, made in two pieces and glued together; the *rawhide cover* B, which increases the strength of the scabbard; the *leather cover* C; the *mouthpiece bushing* P; the *mouthpiece top* D; the *mouthpiece body* Q, riveted to the wooden body by the *rivets* E E; the *mouthpiece hooks* F F, either of which by its engagement with the hook of the bayonet scabbard catch on the bayonet retains the bayonet in its place in the scabbard; the *scabbard hook* G, attached to the body by the *hook rivet* H, which passes through the *inside* and *outside washers* I and K, and the *stop washer* L; the *fastener* M, and the *drain eyelet* N. An offset on the lower end of the hook, traveling in its recess in the stop washer, limits the oscillation of the hook to 50 degrees on each side of the vertical.

Fig. 117.

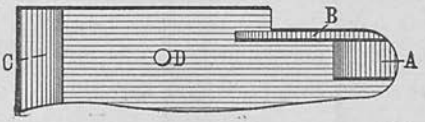
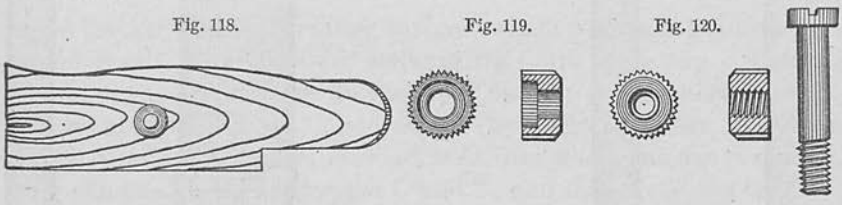


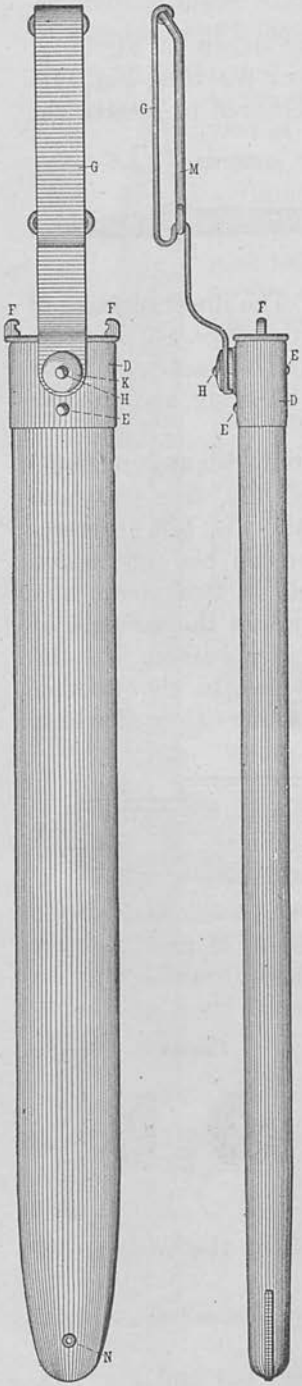
Fig. 118. Fig. 119. Fig. 120. Fig. 121.



NOTE.—The cavalry is equipped with the United States rifle, caliber .30, model of 1903, but without the bayonet or bayonet scabbard.

The BAYONET SCABBARD, Model of 1910, Fig. 124 and Fig. 125, consists of a wooden body covered with rawhide, over which is sewed

Fig. 122.



Model of 1905.

Fig. 123.

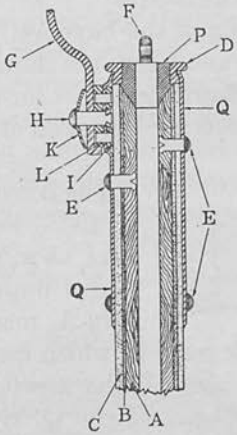


Fig. 124.

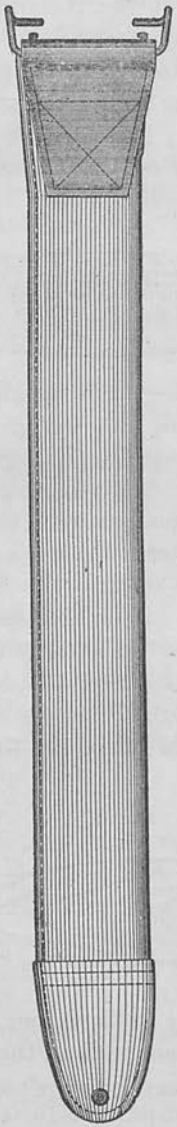
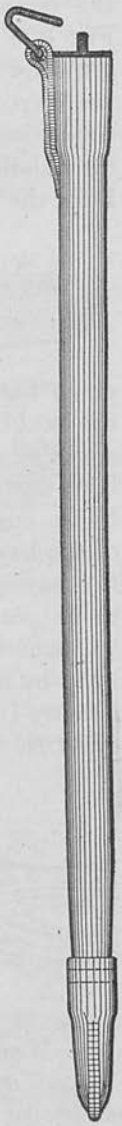


Fig. 125.



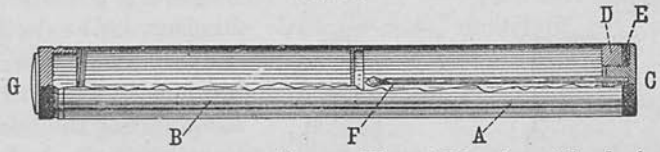
Model of 1910.

a duck cover, or is fitted a woven fabric cover, olive-drab in color. The bayonet is held fast in the scabbard by means of two mouthpiece hooks on opposite sides of the mouthpiece top. The scabbard is fastened to the belt or pack of the soldier by a double-hook which is attached to the scabbard by the duck hanger sewed to the cover.

APPENDAGES.

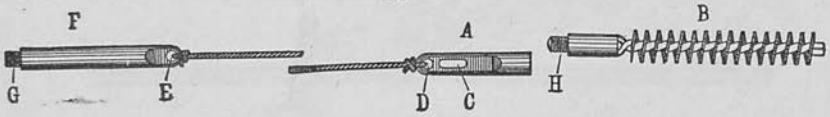
The DRIFT SLIDE No. 4 and DRIFT SLIDE No. 6 are furnished, two of each for every ten rifles. The two drift slides have peepholes respectively 0.04 inch and 0.06 inch in diameter; and have drift slide pins assembled to them.

Fig. 126.



The OILER AND THONG CASE, Fig. 126, furnished for every rifle, is carried in the butt of the stock. It consists of a sand-blasted brass tube, nickle plated but not polished, about 6 inches long and three-quarters inch in diameter, divided transversely near the center by a partition. Both ends are closed by screw caps. In one section is carried a small supply of sperm oil, and in the other the thong and thong brush used for cleaning the bore of the rifle. The cap on the oil section is fitted with a wire, flattened at its point, which reaches to the bottom of the section and is used for applying oil, a drop or more at a time. *The oil is only for the lubrication of working parts.* The cap is also provided with a leather washer to prevent leakage. The cap on the thong section

Fig. 127.

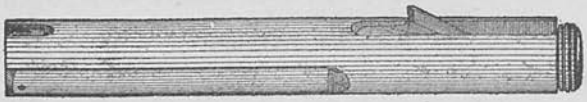


has a leather pad on its outer surface, which prevents the noise that would result from the oiler striking the butt plate cap. The oiler should always be inserted in the stock so that the leather-tipped cap will be next to the butt plate cap. The parts as shown in cut are: *Thong case body* A and B; *oiler collar* D, into which the cap is screwed; *oiler cap washer* E; *oil dropper* C and F, and *thong case cap* G.

The THONG AND THONG BRUSH are shown in Fig. 127. The *thong tip* A, into which the *thong brush* B is screwed, is provided with a *rag slot* C; the thong cord is knotted in the *hole* D in the tip, and also in the *hole* E in the weight. In cleaning the bore by means of the thong, the brush or rag should always be drawn from the muzzle toward the breech.

The SPARE PART CONTAINER, Fig. 128, consists of a cylindrical block of wood (hard maple), 5.8 inches long and 0.785 inch in diameter. Slots and recesses are cut for holding three spare parts—

Fig. 128.



a striker, an extractor, and a firing pin. The container may be carried in the butt of the stock, in lieu of the oiler and thong case.

The FRONT SIGHT COVER, Fig. 129, right side view, and Fig. 130, front view, is made of sheet steel and pressed into shape. It is then case-hardened, giving it sufficient spring to cause it to hug closely the barrel and front sight stud, thereby retaining its position on the barrel.

Fig. 129.

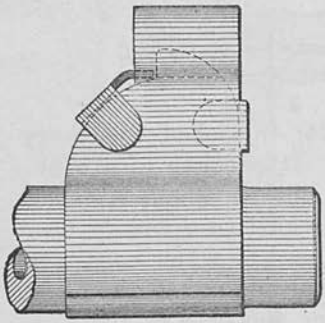
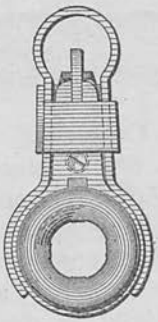


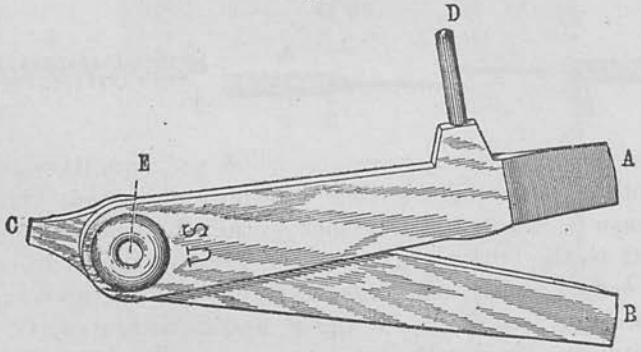
Fig. 130.



ACCESSORIES.

The SCREW-DRIVER, Fig. 131, has the *large blade* A, the *small blade* B, the *spur* C, the *pin* D, and the *rivet* E. The large blade should be used for the large butt plate screw, the butt plate spring screw, and the guard screws; the small blade for all other screws, except the cut-off screw, for which

Fig. 131.

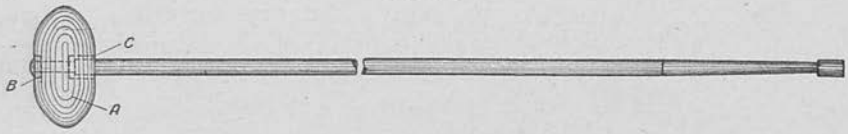


the spur should be used. The pin serves as a drift in removing the butt plate cap, ejector, floor plate catch, sear and trigger pins, and the lower band spring.

The BARRACK CLEANING ROD, model of 1916, Fig. 132, is made of brass rod, 0.25 inch in diameter, and of sufficient length so that the bore can

be cleaned from the breech end. It has the *knob* A, the *steel collar* B, and a *brass sleeve* C riveted on the end of the rod. The knob swivels on the rod between the collar and the sleeve. The other end has a socket for connection with the thong brush issued with the rifle. This rod is intended for use in garrison and camp service.

Fig. 132.



The CLEANING ROD, model of 1916, supersedes the cleaning rod, model of 1913, although the latter will be issued until the supply is exhausted. Unserviceable cleaning rods, model of 1913, are used partly in the manufacture of the model of 1916 rod and should be turned in to the Commanding Officer, Springfield Armory, by proper authority for this purpose.

The New Rod is a jointed brass rod, 0.25 inch in diameter and 36.187 ($36\frac{3}{16}$) inches long. It is made of four sections; the handle section with knob, Fig. 133; the second section, Fig. 134; the third section, Fig. 135; and the brush section, Fig. 136, to which may be attached the thong brush issued with the rifle.

Fig. 133.

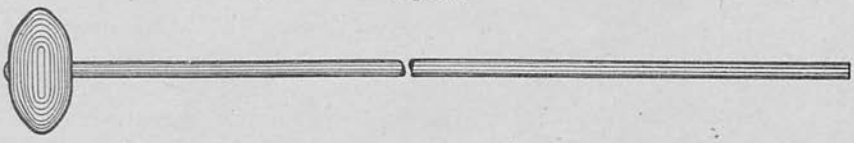


Fig. 134.



Fig. 135.



Fig. 136.



This rod and case are intended for use in field service only.

THE ASSEMBLED PARTS AND THEIR OPERATIONS.

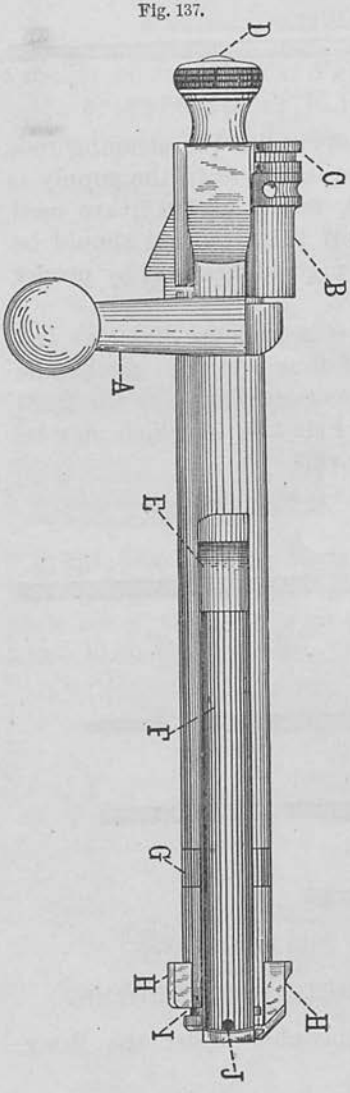
Most of the operating parts may be included under the BOLT MECHANISM and MAGAZINE MECHANISM.

The BOLT MECHANISM consists of the bolt, sleeve, sleeve lock, extractor, extractor collar, safety lock, firing pin, firing pin sleeve,

striker, and mainspring. It is shown, assembled, in Fig. 137. The parts shown in the cut are *handle* A, *sleeve* B, *safety lock* C, *cocking piece* D, *safety lug* E, *extractor* F, *extractor collar* G, *locking lugs* H, *extractor tongue groove* I, and *gas escape hole* J.

The bolt moves backward and forward and rotates in the well of the receiver; it carries a cartridge, either from the magazine, or one placed by hand in front of it, into the chamber and supports its head when fired.

Fig. 137.



The sleeve unites the parts of the bolt mechanism, and its rotation with the bolt is prevented by the lugs on its sides coming in contact with the receiver.

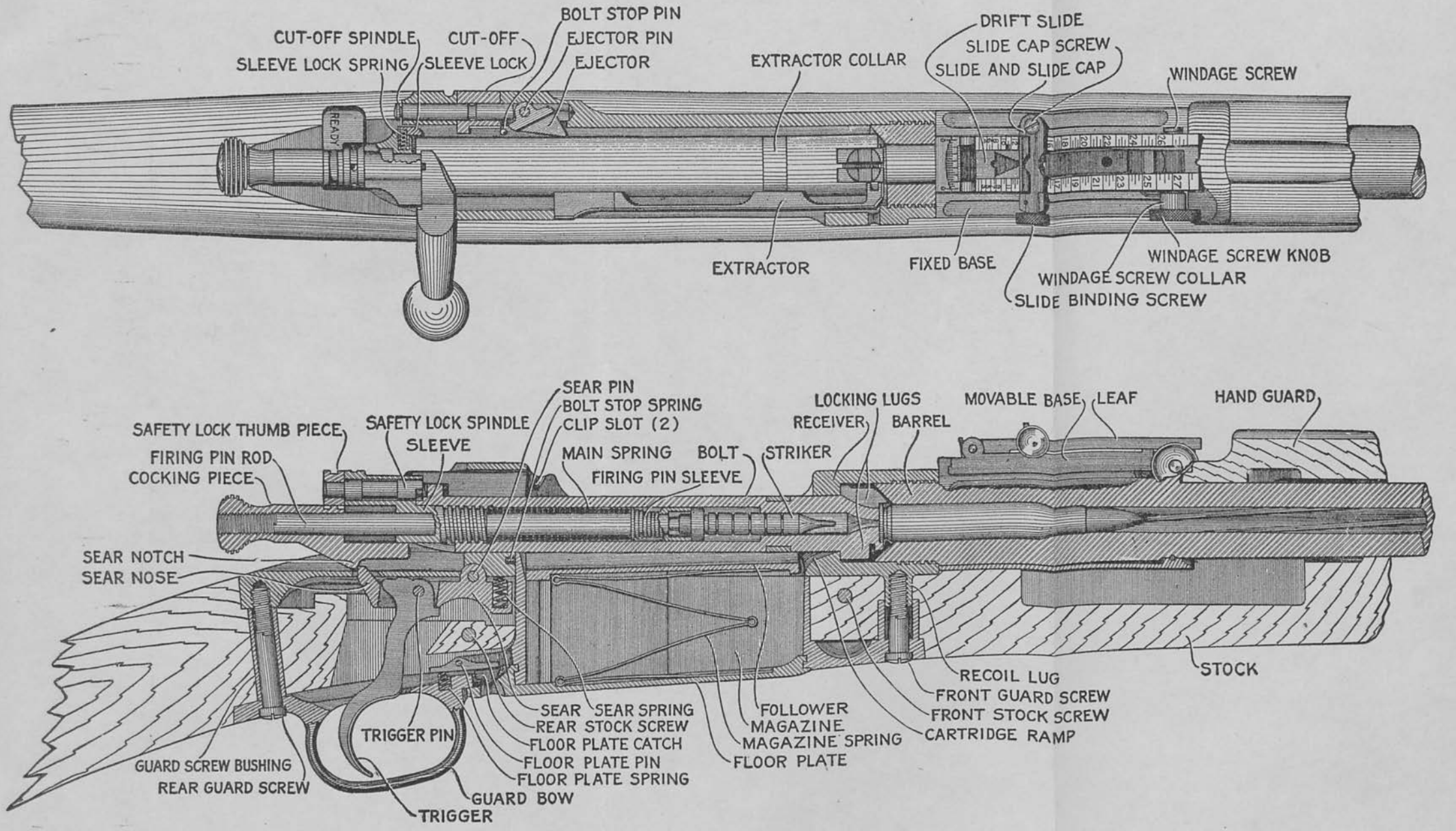
The hook of the extractor engages in the groove of the cartridge case and retains the head of the latter in the countersink of the bolt until the case is ejected.

The safety lock, when turned to the left, is inoperative; when turned to the right—*which can only be done when the piece is cocked*—the point of the spindle enters its notch in the bolt and locks the bolt; at the same time its cam forces the cocking piece slightly to the rear, out of contact with the sear, and locks the firing pin.

The bolt mechanism operates as follows: To open the bolt, raise the handle until it comes in contact with the left side of the receiver and pull directly to the rear until the top locking lug strikes the cut-off.

Raising the handle rotates the bolt and separates the locking lugs from their locking shoulders in the receiver, with which they have been brought into close contact by the powder pressure. This rotation causes the cocking cam of the bolt to force the firing pin to the rear, drawing the point of the striker into the bolt, rotation of the firing pin being prevented by the lug on the cocking piece projecting, through the slot in the sleeve, into its groove in the receiver. As the sleeve remains longitudinally stationary with reference to the bolt, this rearward motion of the firing pin, and consequently of the striker, will

FIG. 138


CUT-OFF SPINDLE
SLEEVE LOCK SPRING
CUT-OFF SLEEVE LOCK
BOLT STOP PIN
EJECTOR PIN
EJECTOR
EXTRACTOR COLLAR
DRIFT SLIDE
SLIDE CAP SCREW
SLIDE AND SLIDE CAP
WINDAGE SCREW
READY
EXTRACTOR
FIXED BASE
WINDAGE SCREW KNOB
WINDAGE SCREW COLLAR
SLIDE BINDING SCREW
SEAR PIN
BOLT STOP SPRING
CLIP SLOT (2)
SAFETY LOCK THUMB PIECE
SAFETY LOCK SPINDLE
SLEEVE
FIRING PIN ROD
COCKING PIECE
MAIN SPRING
BOLT
STRIKER
FIRING PIN SLEEVE
LOCKING LUGS
RECEIVER
BARREL
MOVABLE BASE
LEAF
HAND GUARD
SEAR NOTCH
SEAR NOSE
TRIGGER PIN
SEAR
SEAR SPRING
REAR STOCK SCREW
FLOOR PLATE CATCH
FLOOR PLATE PIN
FLOOR PLATE SPRING
GUARD SCREW BUSHING
REAR GUARD SCREW
GUARD BOW
TRIGGER
FOLLOWER
MAGAZINE
MAGAZINE SPRING
FLOOR PLATE
RECOIL LUG
FRONT GUARD SCREW
FRONT STOCK SCREW
CARTRIDGE RAMP
STOCK

start the compression of the mainspring, since the rear end of the latter bears against the front end of the barrel of the sleeve and its front end against the rear end of the firing pin sleeve.

When the bolt handle strikes the receiver, the locking lugs have been disengaged, the firing pin has been forced to the rear until the sear notch of the cocking piece has passed the sear nose, the cocking piece nose has entered the cock notch in the rear end of the bolt, the sleeve lock has engaged its notch in the bolt, and the mainspring has been almost entirely compressed.

During the rotation of the bolt a rear motion has been imparted to it by its extracting cam coming in contact with the extracting cam of the receiver, so that the cartridge case will be started from the chamber.

The bolt is then drawn directly to the rear, the parts being retained in position by the cocking piece nose remaining in the cock notch and locked by the sleeve lock engaging its notch in the bolt.

To close the bolt, push the handle forward until the extracting cam on the bolt bears against the extracting cam on the receiver, thereby unlocking the sleeve from the bolt, and turn the handle down. As the handle is turned down the cams of the locking lugs bear against the locking shoulders in the receiver, and the bolt is forced slightly forward into its closed position. As all movement of the firing pin is prevented by the sear nose engaging the sear notch of the cocking piece, this forward movement of the bolt completes the compression of the mainspring, seats the cartridge in the chamber, and, in single loading, forces the hook of the extractor into the groove of the cartridge case. In loading from the magazine the hook of the extractor, rounded at its lower edge, engages in the groove of the top cartridge as it rises from the magazine under the action of the follower and magazine spring.

The position then occupied by the parts is shown in Fig. 138, and the piece is ready to fire.

To pull the trigger, the finger piece must be drawn to the rear until contact with the receiver is transferred from its bearing to the heel, which gives a creep to the trigger, and then until the sear nose is withdrawn from in front of the cocking piece.

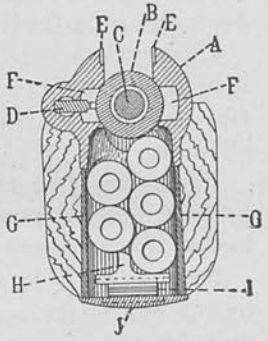
Just before the bolt is drawn fully to the rear, the top locking lug strikes the heel of the ejector, throwing its point suddenly to the right in the lug slot. As the bolt moves fully to the rear, the rear face of the cartridge case strikes against the ejector point and the case is ejected, slightly upward and to the right, from the receiver.

Double loading from the magazine is prevented by the extractor engaging the cartridge case as soon as it rises from the magazine and holding its head against the face of the bolt until ejected.

It will be noted that in this system of bolt mechanism the compression of the mainspring, the seating of the cartridge in and the starting of the empty case from the chamber are entirely done by the action of cams.

The piece may be cocked either by raising the bolt handle until it strikes the left side of the receiver and then immediately turning it down or by pulling the cocking piece directly to the rear.

Fig. 139.



In firing, unless the bolt handle is turned fully down, the cam on the cocking piece will strike the cocking cam on the bolt, and the energy of the mainspring will be expended in closing the bolt, instead of on the primer; this prevents the possibility of a cartridge being fired until the bolt is fully closed.

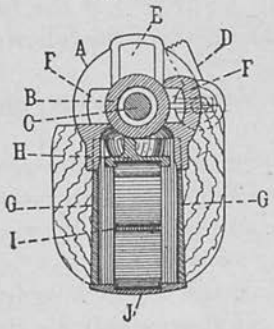
The opening and closing of the bolt should each be done by one continuous motion.

The MAGAZINE MECHANISM includes the floor plate, follower, magazine spring, and cut-off.

Fig. 139 represents a cross section through the ejector with the magazine loaded. The parts shown are *receiver* A, *bolt* B, *firing pin* C, *ejector* D, *clip slots* E, *bolt locking lug channels* F, *magazine* G, *follower* H, *magazine spring* I, and *floor plate* J.

Fig. 140 shows a cross section through the magazine with the magazine empty, and with cut-off "on," shown in projection. The parts are *receiver* A, *bolt* B, *firing pin* C, *cut-off* D, *rear lug slot* E, *bolt locking lug channels* F, *magazine* G, *follower* H, *magazine spring* I, and *floor plate* J.

Fig. 140.



To charge the magazine, see that the cut-off is turned up showing "on," draw the bolt fully to the rear, insert the cartridges from a clip, or from the hand, and close the bolt. To charge the magazine from a clip, place either end of a loaded clip in its seat in the receiver and, with the thumb of the right hand, press the cartridges down into the magazine until the top cartridge is caught by the right edge of the receiver. The manner in which the cartridges arrange themselves in the magazine and the position of the follower and compressed magazine spring are shown in Fig. 142. The cartridge ramp guides the bullet and cartridge case into the chamber. The magazine can be filled, if partly filled, by inserting cartridges one by one.

Pushing the bolt forward, after charging the magazine, ejects the clip.

When the cut-off is turned down, the magazine is "off." The bolt can not be drawn fully back, and its front end projecting over the rear end of the upper cartridge holds it down in the magazine below the action of the bolt. The magazine mechanism then remains inoperative, and the arm can be used as a single-loader, the cartridges in the magazine being held in reserve. The arm can readily be used as a single-loader with the magazine empty.

When the cut-off is turned up, the magazine is "on;" the bolt can be drawn fully to the rear, permitting the top cartridge to rise high enough to be caught by the bolt in its forward movement. As the bolt is closed this cartridge is pushed forward into the chamber, being held up during its passage by the pressure of those below. The last one in the magazine is held up by the follower, the rib on which directs it into the chamber.

In magazine fire, after the last cartridge has been fired and the bolt drawn fully to the rear, the follower rises and holds the bolt open to show that the magazine is empty.

PRECAUTIONS.

If it is desired to carry the piece cocked, with a cartridge in the chamber, the bolt mechanism should be secured by turning the safety lock to the right. Under no circumstances should the firing pin be let down by hand on a cartridge in the chamber.

To obtain positive ejection, and to insure the bolt catching the top cartridge in magazine, when loading from the magazine, the bolt must be drawn fully to the rear in opening it.

When the bolt is closed, or slightly forward, the cut-off may be turned up or down, as desired. When the bolt is in its rearmost position, to pass from loading from the magazine to single loading it is necessary to force the top cartridge or follower below the reach of the bolt, to push the bolt slightly forward and to turn the cut-off down, showing "off."

In case of a misfire it is unsafe to draw back the bolt immediately, as it may be a case of hangfire. In such cases the piece should be cocked by drawing back the cocking piece.

It is essential for the proper working and preservation of all cams that they be kept lubricated.

Never fire the rifle with cosmoline in the bore or any obstruction in the bore whether near the breech or the muzzle. Practically all cases of burst barrels can be traced to some obstruction left in the bore, such as a cleaning patch, mud, or the like.

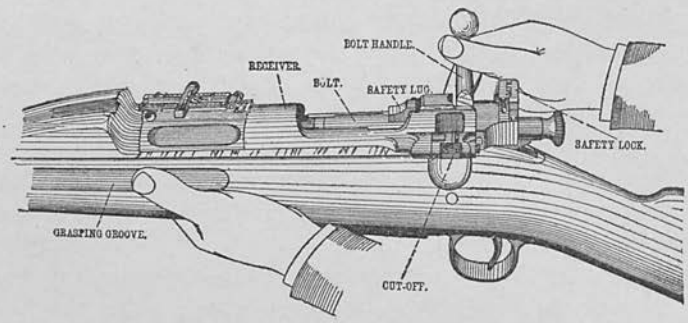
DISMOUNTING AND ASSEMBLING BY SOLDIER.

The bolt and magazine mechanism can be dismounted without removing the stock. The latter should never be done, except for making repairs, and then only by some selected and instructed man.

TO DISMOUNT BOLT MECHANISM.

Place the cut-off at the center notch; cock the arm and turn the safety lock to a vertical position, raise the bolt handle and draw out the bolt. (Fig. 141.)

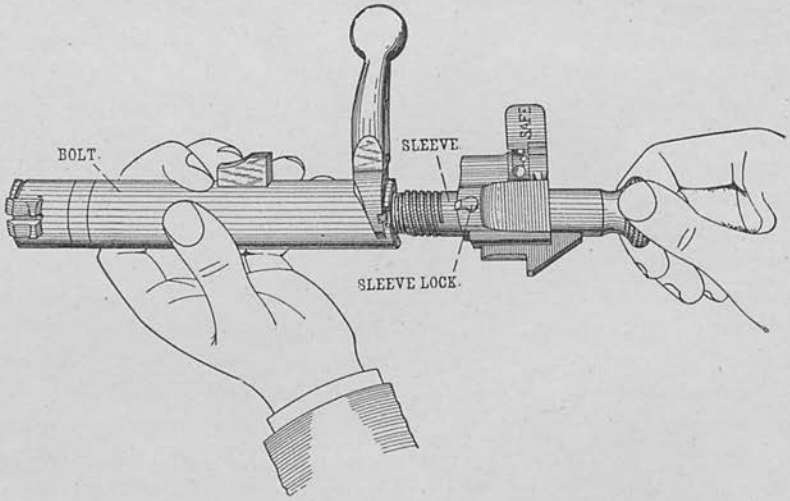
Fig. 141.



Hold bolt in left hand, press sleeve lock in with thumb of right hand to unlock sleeve from bolt, and unscrew sleeve by turning to the left. (Fig. 142.)

Hold sleeve between forefinger and thumb of the left hand, draw cocking piece back with middle finger and thumb of right hand, turn

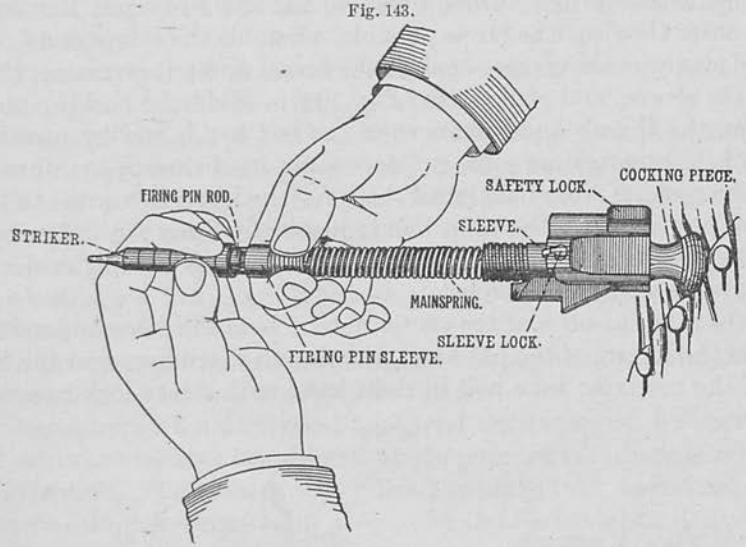
Fig. 142.



safety lock down to the left with the forefinger of the right hand, in order to allow the cocking piece to move forward in sleeve, thus partially relieving the tension of mainspring; with the cocking piece against the breast, draw back the firing pin sleeve with the forefinger

and thumb of right hand and hold it in this position (Fig. 143) while removing the striker with the left hand; remove firing pin sleeve and mainspring; pull firing pin out of sleeve; turn the extractor to the

Fig. 143.

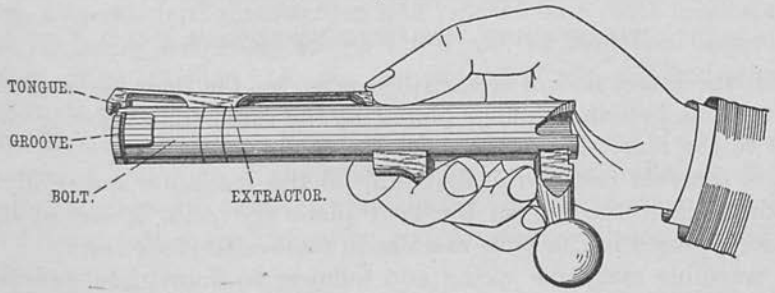


right, forcing its tongue out of its groove in the front of the bolt, and force the extractor forward (Fig. 144) and off the bolt.

TO ASSEMBLE BOLT MECHANISM.

Grasp with the left hand the rear of the bolt, handle up, and turn the extractor collar with the thumb and forefinger of the right hand until its lug is on a line with the safety lug on the bolt; take the extractor in the right hand and insert the lug on the collar in the

Fig. 144.



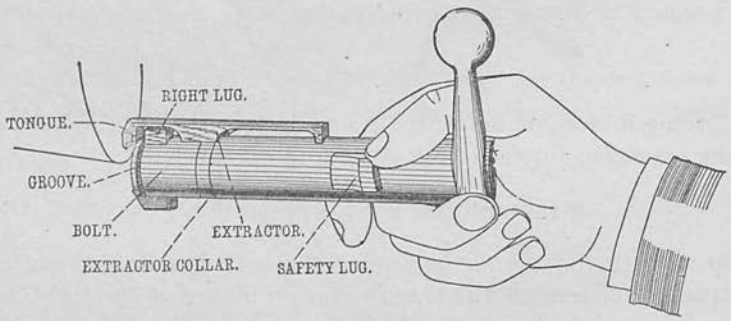
undercuts in the extractor by pushing the extractor to the rear until its tongue comes in contact with the rim on the face of the bolt (a slight pressure with the left thumb on the top of the rear part of the extractor assists in this operation); turn the extractor to the right until it is over the right lug; take the bolt in the right hand and press

the hook of the extractor against the butt plate (Fig. 145) or some rigid object, until the tongue on the extractor enters its groove in the bolt.

With the safety lock turned down to the left to permit the firing pin to enter the sleeve as far as possible, assemble the sleeve and firing pin; place the cocking piece against the breast and put on mainspring, firing pin sleeve, and striker (see Fig. 143). Hold the cocking piece between the thumb and forefinger of the left hand, and by pressing the striker point against some substance, not hard enough to injure it, force the cocking piece back until the safety lock can be turned to the vertical position with the right hand; insert the firing pin in the bolt and screw up the sleeve (by turning it to the right) until the sleeve lock enters its notch on the bolt.

See that the cut-off is at the center notch; hold the piece under floor plate in the fingers of the left hand, the thumb extending over the left side of the receiver; take bolt in right hand with safety lock in a ver-

Fig. 145.



tical position and safety lug up; press rear end of follower down with left thumb and push bolt into the receiver; lower bolt handle; turn safety lock and cut-off down to the left with right hand.

TO DISMOUNT MAGAZINE MECHANISM.

With the bullet end of a cartridge press on the floor plate catch (through the hole in the floor plate), at the same time drawing the bullet to the rear; this releases the floor plate.

Raise the rear end of the first limb of the magazine spring high enough to clear the lug on the floor plate and draw it out of its mortise; proceed in the same manner to remove the follower.

To assemble magazine spring and follower to floor plate, reverse operation of dismounting.

Insert the follower and magazine spring in the magazine, place the tenon on the front end of the floor plate in its recess in the magazine, then place the lug on the rear end of the floor plate in its slot in the guard, and press the rear end of the floor plate forward and inward at the same time, forcing the floor plate into its seat in the guard.

TO COMPLETE DISMOUNTING.

(Not to be done by soldier.)

The bolt and magazine mechanism having been dismounted, proceed as follows:

1. Turn safety lock to dismounting bevel on sleeve and remove it by striking the thumb piece a light blow.

2. To dismount the sleeve lock, drive out sleeve lock pin from the top and remove lock and spring, being careful not to lose the spring.

3. Remove front sight pin (see directions for replacing broken parts, p. 47) and remove front sight.

4. Press in rear end of lower band spring and drive forward the lower band by a few sharp blows on the lug and then on top with a hardwood block.

5. Remove upper band screw and drive upper band forward, in the same manner prescribed for the lower band.

6. Move upper band forward on barrel until stopped by movable stud, and then remove lower band by slipping it over upper band and movable stud. To remove upper band entirely from barrel requires the removal of the front sight screw and the movable stud.

7. Draw hand guard forward until free from the fixed base and remove.

8. Remove guard screws and guard. It may be necessary to tap gently on the front and rear of the guard bow to loosen.

9. Remove barrel and receiver from stock.

10. To remove the lower band spring, drive its spindle out of its hole in the stock from the left.

11. Unscrew the butt swivel screws and remove the butt swivel plate from stock. The butt swivel, consisting of the plate, swivel, and pin, permanently assembled, is issued complete.

12. Unscrew butt plate screws and remove butt plate from stock.

13. Unscrew butt plate spring screw and remove the butt plate spring; drive out butt plate pin (see direction on p. 47) and remove butt plate cap.

14. Remove cut-off by loosening the screw in the end of the thumb piece until it disengages the groove in the cut-off spindle; insert the blade of a screw-driver in the notch in the rear end of the spindle and force it out. Remove the spring and the plunger, being careful not to lose them.

15. Remove the ejector by driving out the ejector pin from the upper side.

16. Remove sear and trigger by driving out the sear pin from the right, being careful not to lose the sear spring.

17. Remove trigger from sear by driving out the trigger pin from either side.

18. Remove floor plate catch and spring by driving out the pin from either side.

19. Remove bolt stop by inserting a small punch or end of striker in the hole in the left end and forcing it from its pocket.

The leaf should never be removed from the movable base except for the purpose of making repairs.

The fixed base and the fixed stud should never be removed from the barrel.

The barrel should never be unscrewed from the receiver. The barrel and receiver may be assembled only at ordnance establishments properly equipped for this work, for which reason requisitions should always call for barrels and receivers assembled and not for barrels alone.

TO ASSEMBLE AFTER DISMOUNTING.

Reverse and follow in inverse order the operations of dismounting.

In assembling the sleeve lock to the sleeve, be careful to compress the lock and spring while driving in the pin from the bottom of the sleeve.

To assemble the safety lock and sleeve, insert the safety lock spindle in its hole in the sleeve as far as it will go; then, with the thumb piece vertical and pressed against some rigid object, introduce the point of the tool provided for this purpose between the safety lock spindle and the safety lock plunger, forcing the latter into the thumb piece until it slips over the edge of the sleeve. Further pressure on the safety lock thumb piece, together with the gradual withdrawal of the tool, will complete the assembling.

In assembling pins and screws, note directions for replacing broken parts on page 47.

The floor plate spring and the cut-off spring are alike, except in length. The latter being the longer, care should be taken not to substitute one for the other.

CLEANING THE RIFLE.

The proper care of the bore requires conscientious, careful work, but it pays well in reduced labor of cleaning and in prolonged accuracy-life of the barrel, and better results in target practice. Briefly stated, the care of the bore consists in removing the fouling resulting from firing to obtain a chemically clean surface and coating this surface with a film of oil to prevent rusting. The fouling which results from firing is of two kinds—one, the products of combustion of the powder; the other, cupro-nickel scraped off (under the abrading action of irregularities or grit in the bore). Powder fouling, because of its acid reaction, is highly corrosive; that is, it will induce rust and

must be removed. Metal fouling of itself is inactive, but may cover powder fouling and prevent the action of cleaning agents until removed, and when accumulated in noticeable quantities it reduces the accuracy of the rifle.

Powder fouling may be readily removed by scrubbing with hot soda solution, but this solution has no effect on the metal fouling of cupro-nickel. It is therefore necessary to remove all metal fouling before assurance can be had that all powder fouling has been removed and that the bore may be safely oiled. Normally, after firing a barrel in good condition, the metal fouling is so slight as to be hardly perceptible. It is merely a smear of infinitesimal thickness, easily removed by solvents of cupro-nickel. However, due to pitting, the presence of dust, other abrasives, or to accumulation, metal fouling may occur in clearly visible flakes or patches of much greater thickness, much more difficult to remove.

In cleaning the bore after firing, it is well to proceed as follows: Swab out the bore with soda solution (see below) to remove powder fouling. A convenient method is to insert the muzzle of the rifle into the can containing the soda solution and, with the cleaning rod inserted from the breech, pump the barrel full a few times. Remove and dry with a couple of patches. Examine the bore to see that there are in evidence no patches of metal fouling which, if present, can be readily detected by the naked eye, then swab out with the swabbing solution—a dilute metal-fouling solution. (See below.) The amount of swabbing required with the swabbing solution can be determined only by experience, assisted by the color of the patches. Swabbing should be continued, however, as long as the wiping patch is discolored by a bluish-green stain. Normally a couple of minutes' work is sufficient. Dry thoroughly and oil.

The proper method of oiling a barrel is as follows: Wipe the cleaning rod dry; select a clean patch and thoroughly saturate it with sperm oil or warmed cosmic, being sure that the cosmic has penetrated the patch; scrub the bore with the patch, finally drawing the patch smoothly from the muzzle to the breech, allowing the cleaning rod to turn with the rifling. The bore will be found now to be smooth and bright, so that any subsequent rust and sweating can be easily detected by inspection.

If patches of metal fouling are seen upon visual inspection of the bore, the standard metal-fouling solution or the tablet solution prepared as hereinafter prescribed must be used. After scrubbing out with the soda solution, plug the bore from the breech with a cork at the front end of the chamber, or where the rifling begins. Slip a 2-inch section of rubber hose over the muzzle down to the sight and fill with the standard solution or the tablet solution to at least one-half inch above the muzzle of the barrel. Let it stand for 30 minutes, pour out the solution, remove hose and breech plug, and swab out thoroughly with soda solution to neutralize and remove all trace of

ammonia and powder fouling. Wipe the barrel clean, dry, and oil. With few exceptions, one application is sufficient, but if all fouling is not removed, as determined by careful visual inspection of the bore and of the wiping patches, repeat as described above.

After properly cleaning with one of the solutions, as has just been described, the bore should be clean and safe to oil and put away, but as a measure of safety a patch should *always* be run through the bore on the next day and the bore and wiping patch examined to insure that cleaning has been properly accomplished. The bore should then be oiled, as described above.

If the solutions are not available, the barrel should be scrubbed, as already described, with the soda solution, dried, and oiled with a light oil. At the end of 24 hours it should again be cleaned, when it will usually be found to have "sweated"; that is, rust having formed under the smear of metal fouling where powder fouling was present, the surface is puffed up. Usually a second cleaning is sufficient, but to insure safety it should be again examined at the end of a few days before final oiling. The swabbing solution should always be used, if available, for it must be remembered that each puff when the bore "sweats" is an incipient rust pit.

A clean dry surface having been obtained, to prevent rust, it is necessary to coat every portion of this surface with a film of neutral oil. If the protection required is but temporary and the arm is to be cleaned or fired in a few days, a sperm oil may be used. This is easily applied and easily removed but has not sufficient body to hold its surface for more than a few days. If rifles are to be prepared for storage or shipment, a heavier oil, such as cosmic, must be used.

In preparing arms for storage or shipment they should be cleaned with particular care, using the metal-fouling solution as described above. Care should be taken, insured by careful inspection on succeeding day or days, that the cleaning is properly done and all traces of ammonia solution removed. The bore is then ready to be coated with cosmic. At ordinary temperatures cosmic is not fluid. In order, therefore, to insure that every part of the surface is coated with a film of oil, the cosmic should be warmed. Apply the cosmic first with a brush; then, with the breech plugged, fill the barrel to the muzzle, pour out the surplus, remove the plug, and allow to drain. It is believed that more rifles are ruined by improper preparation for storage than from any other cause. If the bore is not clean when oiled—that is, if powder fouling is present or rust has started—a half inch of cosmic on the outside will not stop its action, and the barrel will be ruined. Remember that the surface must be perfectly cleaned before the heavy oil is applied. If the instructions as given above are carefully followed, arms may be stored for years without harm.

PREPARATION OF SOLUTIONS.

Soda solution.—This should be a saturated solution of sal soda (carbonate of soda). A strength of at least 20 per cent is necessary. The spoon referred to in the following directions is the model of 1910 spoon issued in the mess outfit.

Sal soda—one-fourth pound, or 4 (four) heaping spoonfuls.

Water—1 pint or cup, model of 1910, to upper rivets.

The sal soda will dissolve more readily in hot water.

Swabbing solution.—Ammonium persulphate—60 grains, one-half spoonful smoothed off.

Ammonia, 28 per cent—6 ounces, or three-eighths of a pint, or 12 spoonfuls.

Water—4 ounces, or one-fourth pint, or 8 spoonfuls.

Dissolve the ammonium persulphate in the water and add the ammonia. Keep in tightly corked bottle; pour out only what is necessary at the time, and keep the bottle corked.

Standard metal-fouling solution.—Ammonium persulphate—1 ounce, or 2 medium heaping spoonfuls.

Ammonium carbonate—200 grains.

Ammonia, 28 per cent—6 ounces, or three-eighths pint, or 12 spoonfuls.

Water—4 ounces, or one-fourth pint, or 8 spoonfuls.

Powder the persulphate and carbonate together, dissolve in the water and add the ammonia; mix thoroughly and allow to stand for one hour before using. It should be kept in a strong bottle, tightly corked. The solution should not be used more than twice, and used solution should not be mixed with unused solution, but should be bottled separately. The solution, when mixed, should be used within 30 days. Care should be used in mixing and using this solution to prevent injury to the rifle. The ammonia solution should not be used in a warm barrel. An experienced noncommissioned officer should mix the solution and superintend its use.

Neither of these ammonia solutions has any appreciable action on steel when not exposed to the air, but if allowed to evaporate on steel they attack it rapidly. Care should, therefore, be taken that none spills on the mechanism and that the barrel is washed out promptly with soda solution. The first application of soda solution removes the greater portion of the powder fouling and permits a more effective and economical use of the ammonia solution. These ammonia solutions are expensive and should be used economically.

Metal-fouling tablets for field use.—For use in the field and under any other circumstances when the standard metal-fouling solution is not available, a solution may be prepared from the metal-fouling

tablets. To prepare the solution the directions on the bottles or containers should be followed. The usual ratio is one caustic soda tablet to four of the ammonium tablets, the ammonium tablets consisting of ammonium persulphate and ammonium sulphate in proper proportion. The size of the ammonium tablet has not been absolutely standardized and it is therefore necessary to refer to the directions on each container for guidance. This will prepare sufficient solution for cleaning four rifles. All the precautions specified above for the use of the standard metal-fouling solution should be observed. As it works more slowly, the solution should be left in the barrel from one and a half to two times as long as the standard metal-fouling solution.

The same solution can be prepared by mixing 3 grams of ammonium persulphate, 5 grams of ammonium sulphate, and 2 grams of caustic soda in 35 cubic centimeters of water.

The standard metal-fouling solution should be preferred when available.

GENERAL REMARKS.

It is a fact recognized by all that a highly polished steel surface rusts much less easily than one which is roughened; also, that a barrel which is pitted fouls much more rapidly than one which is smooth. Every effort, therefore, should be made to prevent the formation of pits, which are merely enlarged rust spots, and which not only affect the accuracy of the arm but increase the labor of cleaning.

The chambers of rifles are frequently neglected because they are not readily inspected. Care should be taken to see that they are cleaned as thoroughly as the bore. A roughened chamber delays greatly the rapidity of fire and not infrequently causes shells to stick.

A cleaning rack should be provided for every barracks. Rifles should always be cleaned from the breech, thus avoiding possible injury to the rifling at the muzzle which would affect the shooting adversely. If the bore for a length of 6 inches at the muzzle is perfect, a minor injury near the chamber will have little effect on the accuracy of the rifle. The rifle should be cleaned as soon as the firing for the day is completed. The fouling is easier to remove then, and if left longer it will corrode the barrel.

If gas escapes at the base of the cartridge, it will probably enter the well of the bolt through the striker hole. In this case the bolt mechanism must be dismounted and the parts and well of the bolt thoroughly cleaned.

Before assembling the bolt mechanism, the firing pin, the barrel of the sleeve, the body of striker, the well of bolt, and all cams should be lightly oiled.

Many of the parts can generally be cleaned with dry rags. All parts after cleaning should be wiped with an oiled rag.

The best method of applying oil is to rub with a piece of cotton cloth upon which a few drops of oil have been placed, thereby avoiding the use of an unnecessary amount of oil; this method will, even in the absence of the oiler, serve for the cams and bearings, which should be kept continually oiled.

Any part that may appear to move hard can generally be freed by the use of a little oil.

The stock and hand guard may be coated with raw linseed oil and polished by rubbing with the hand.

Sperm oil should only be used for lubricating metallic bearing and contact surfaces.

For the chamber and bore, only cosmoline or cosmic should be used. This should also be applied to all metallic surfaces, to prevent rusting when arms are stored or when not used for an appreciable length of time.

PACKING OF RIFLE.

The rifles are issued in arm chests containing:

10 United States Rifles, Caliber .30, Model of 1903.
10 Oiler and Thong Cases.
10 Thongs and Thong Brushes.
1 book, Description and Rules for the Management of the United States Rifle, Caliber .30, Model of 1903, Form 1923.

The interior of the arm chest is provided with wooden packing strips for the purpose of securely holding the rifles in place in transportation. The arrangement of this packing and of the rifles should be carefully observed when arms are received from an arsenal, in order that the same method may be used if for any reason the rifles should be shipped away from the post. Rifles should never be shipped in these chests unless all of the packing strips have been properly assembled with the rifles in the chests.

The ends of these chests are provided with narrow pockets for the reception of the descriptive pamphlet which is shipped with the rifles.

Plate II, at the back of this pamphlet, shows the arm chest in detail.

ARM LOCKER FOR UNITED STATES RIFLE, CALIBER .30, MODEL OF 1903.

This chest is issued at the rate of one per company or troop for use in the safe-keeping of the surplus rifles of a company or troop. It is provided with reinforcing angle irons which secure the bottom of the chest to the sides; and with blind strap hinges, hasps, and staples for securing the cover to the body of the chest. Two padlocks with chains and keys are also issued with each arm locker.

Plate III, at the back of this pamphlet, shows the arm locker in detail.

IMPROVING PERFORMANCES OF RIFLES.

INSTRUCTIONS FOR WORKING DOWN BOLTS OF THE U. S. RIFLE, CALIBER .30, MODEL OF 1903.

(Not to be done by soldier.)

When the bolts of rifles fail to function smoothly, they may be worked down under the supervision of division, camp, post, or station *ordnance officers*, in accordance with War Department Bulletin No. 9, dated March 3, 1919, in the following manner:

ABRASIVE.

To the best Turkish flour of emery add enough kerosene oil to make a medium thin paste. Apply with end of a match or sliver of wood.

FIRST OPERATION.

SMOOTHING EXTRACTING CAM.—Strip down arm to receiver, barrel, and bolt. Remove firing-pin mechanism from bolt. Place receiver with barrel attached in bench vise, using either wood or leather between vise jaws to prevent damage to arm. Muzzle and chamber of the barrel to be plugged with a small rag. The front or muzzle end of barrel to be slightly elevated in vise.

Apply a small quantity of abrasive (mixed as stated above) to the primary extracting cam (situated at the left rear end of receiver). Enter bolt in receiver. Apply mixture to extracting cam of bolt. Grasp handle of bolt in palm of right hand and with a forward pressure upon bolt handle, rotate handle of bolt rapidly back and forth, at the same time maintaining enough forward pressure upon bolt to keep cam surface of receiver and bolt in contact. Continue this operation until a smooth, regular surface is obtained upon both cam surfaces. Wipe dry and thoroughly clean all surfaces of *bolt* and *receiver* from *all traces of abrasive used*, and then rinse thoroughly in gasoline.

SECOND OPERATION.

SMOOTHING COCKING CAM.—Reassemble firing-pin mechanism to bolt. Apply a small quantity of abrasive mixture to cocking cam surfaces of both bolt and cocking piece. Enter bolt in receiver. Close bolt. Be sure that trigger and sear are removed from receiver. Grasp bolt handle in palm of right hand and, with a slight forward pressure upon bolt handle, rapidly cock and release firing pin by rotating bolt handle up and down. Continue this operation until a satisfactory smooth surface is obtained. Clean, dry, and wash all

surfaces thoroughly from *all traces of the abrasive*, as it is very important that no trace remain to cause undue wear and injury to mechanism.

THIRD OPERATION.

FREEING EXTRACTOR COLLAR.—Provide a pair of special hardwood jaws with a recess to engage lug of extractor collar and clearance for body of extractor collar. Place jaws in vise, inserting bolt so that lug on extractor collar falls in dogging slot provided. Close vise with jaws encircling body of bolt, allowing bolt to be freely rotated. A 0.25-inch hole should be drilled in the hardwood vise jaws to allow for insertion of the lubricating medium.

Prepare a soft brass plug, one end turned and threaded to screw into rear end of bolt; the other end, either squared or rounded, to be gripped by any suitable rotating member, preferably a bit brace or breast drill. With brass plug screwed into bolt and gripped by jaws of bit brace or breast drill, rapidly rotate bolt, applying freely plain *kerosene oil* only, until extractor collar is entirely free. Clean, wash, and dry bolt.

IN GENERAL.

A special precaution should obtain to entirely remove all trace of the abrasive from the arm. All washing and cleansing operations should be performed with the barrel held in a vertical position.

Special hardwood vise jaws and brass plug mentioned above are being prepared and issued for this purpose.

REPAIR OF RIFLE.

The following spare parts will be issued for repairs of arms in the hands of troops:

RIFLE.

- Bolt:
  - Bolt. } Assembled.
  - Extractor Collar. }
- Bolt stop:
  - Bolt Stop Pin. } Assembled.
  - Bolt Stop Spring. }
- Butt Plate.
- Butt Plate Cap.
- Butt Plate Pin.
- Butt Plate Screw, Large.
- Butt Plate Screw, Small.
- Butt Plate Spring.
- Butt Plate Spring Screw.
- Butt Swivel:
  - Butt Swivel. } Assembled.
  - Butt Swivel Pin. }
  - Butt Swivel Plate. }
- Butt Swivel Screw.
- Cut-off.
- Cut-off Plunger.
- Cut-off Screw.
- Cut-off Spindle.
- Cut-off Spring.
- Ejector.
- Ejector Pin.
- Extractor.
- Firing Pin:
  - Cocking Piece. } Assembled.
  - Firing Pin Rod. }
- Firing Pine Sleeve.
- Floor Plate.
- Floor Plate Catch.
- Floor Plate Pin.
- Floor Plate Spring.
- Follower.
- Front Sight.
- Front Sight Pin.
- Guard.
- Guard Screw Bushing.
- Guard Screw, Front.
- Guard Screw, Rear.
- Hand Guard.
- Hand Guard Clip.
- Lower Band.
- Lower Band Screw.
- Lower Band Spring.
- Lower Band Swivel.
- Magazine Spring.
- Mainspring.
- Rear Sight:
  - Base Spring.
  - Drift Slide No. 5—
    - Drift Slide, .05 Peep. } Assembled.
    - Drift Slide Pin. }
  - Joint Pin.
  - Leaf.
  - Movable Base.
  - Slide—
    - Slide. } Assembled.
    - Slide Cap. }
  - Slide Binding Screw.
  - Slide Cap Pin.
  - Slide Cap Screw.
  - Windage Screw—
    - Windage Screw. } Assembled.
    - Windage Screw Collar. }
    - Windage Screw Knob. }
    - Windage Screw Pin. }
    - Windage Screw Spring. }
- Safety Lock:
  - Safety Lock Plunger. } Assembled.
  - Safety Lock Spindle. }
  - Safety Lock Spring. }
  - Safety Lock Thumb Piece. }

- Sear.
- Sear Pin.
- Sear Spring.
- Sleeve:
  - Sleeve. } Assembled or separately.
  - Sleeve Lock. } Assembled or separately.
  - Sleeve Lock Pin. } Assembled or separately.
  - Sleeve Lock Spring. } Assembled or separately.
- Stacking Swivel.
- Stacking Swivel Screw.
- Stock:
  - Guard Screw Bushing. } Assembled.
  - Stock. } Assembled.
  - Stock Screws. } Assembled.
  - Stock Screw Nuts. } Assembled.
- Striker.
- Trigger.
- Trigger Pin.
- Upper Band.
- Upper Band Screw.

APPENDAGES.

- Drift Slide No. 4:
  - Drift Slide, .04 Peep. } Assembled.
  - Drift Slide Pin. } Assembled.
- Drift Slide No. 6:
  - Drift Slide, .06 Peep. } Assembled.
  - Drift Slide Pin. } Assembled.
- Front Sight Cover.
- Oiler and Thong Case:
  - Oil Dropper.
  - Oiler Cap Washer.
  - Thong Case Body—
    - Oiler Collar. } Assembled.
    - Thong Case Body. } Assembled.
    - Thong Case Partition. } Assembled.
- Oiler and Thong Case—Contd.
  - Thong Case Cap—
    - Thong Case Cap. } Assembled.
    - Thong Case Pad. } Assembled.
- Thong:
  - Thong Cord.
  - Thong Tip.
  - Thong Weight.
- Thong Brush.
- Spare Part Container (wood part).

ACCESSORIES.

- Cleaning Rod, Model of 1916:
  - Handle section—
    - Handle section. } Assembled.
    - Knob. } Assembled.
    - Collar. } Assembled.
    - Sleeve. } Assembled.
- Cleaning Rod—Contd.
  - Second section.
  - Third section.
  - Brush section.
- Cleaning Rod Case.
- Screw Driver.

BAYONET, MODEL OF 1905.

- Bayonet, complete.
- Bayonet Catch.
- Bayonet Grip, Left.
- Bayonet Grip, Right.
- Bayonet Nut.
- Bayonet Scabbard Catch.
- Bayonet Screw.
- Bayonet Spring.
- Bayonet Washer.

ARM REPAIR CHEST, MODEL OF 1910.

This chest will be issued to each organization armed with the rifle, and to each regimental or post ordnance officer for cleaning, repairing, and preserving arms and equipments. The chest contains the following tools, cleaning material, and spare parts:

TOOLS.

1 Anvil.
1 Bullet Jacket Extractor.
10 Drifts, for the following pins and springs—
- No. 1. Assembling and dismounting base spring.
- No. 2. Removing trigger and butt plate pins.
- No. 3. Starting front sight and sleeve lock pins.
- No. 4. Drawing out pins started with No. 3.
- No. 5. Removing joint, sear, and ejector pins.
- No. 6. Starting floor plate pin and removing bolt stop.
- No. 7. Driving out floor plate pin and lower band spring.
- No. 8. Starting windage screw pin and slide cap pin (2).
- No. 9. Removing pins started with No. 8.

1 Eyelet Awl, for putting eyelets in belt.
1 Eyelet Set.
3 Files, 6-inch; flat, round, and three-square, with handles.
1 Hammer, steel.
1 Hammer, brass.
1 Handle, tool, containing 10 tools.
1 Oiler, with cap.
2 Pliers, flat and round nose.
1 Saw, crosscut, detachable handle.
2 Screw Drivers, fitting the following screws—
- No. 1. Guard, large butt plate, and butt plate spring screws.
- No. 2. Stacking swivel, lower band, butt swivel, small butt plate, upper band, and bayonet screws.

1 Set No. 1, for upsetting ends of the lower band and stacking swivel screws.
1 Tool, for assembling safety lock on sleeve.
1 Vise, 1.25-pound.

CLEANING MATERIAL.

2 Cosmic, pints.
250 Cut Patches (cotton flannel).
250 Cut Patches (Tampa flannel).
3 Sperm Oil, pints.

SPARE PARTS (RIFLE).

2 Base Springs.
2 Bayonet Catches.
2 Bayonet Springs.
2 Bolts, with extractor collars, assembled.
15 Cocking Pieces and Firing Pin Rods, assembled.
5 Cut-off Plungers.
5 Cut-off Springs.
2 Cut-off Screws.

6 Drift Slides.
5 Ejector Pins.
4 Extractors.
5 Ejectors.
2 Floor Plate Catches.
2 Floor Plate Pins.
2 Floor Plate Springs.
5 Front Sights.
10 Front-sight Covers (appendages to rifle).
5 Front-sight Pins.
2 Leaves.
2 Lower Band Screws.
2 Mainsprings.
2 Movable Bases.
3 Safety Locks, complete, each consisting of:
  1 Safety Lock Thumb Piece.
  1 Safety Lock Plunger.
  1 Safety Lock Spindle.
  1 Safety Lock Spring.
5 Slide Binding Screws.
10 Slide Cap Pins.
5 Slide Cap Screws.
6 Slides and Slide Caps, assembled.
3 Sleeves, assembled.
1 Stacking Swivel.
2 Stacking Swivel Screws.
15 Strikers.
2 Windage Screws, assembled.

TOOLS FOR REPAIRING SADDLES, MODEL OF 1912.

1 Screw Driver, Model of 1912.
1 Socket Wrench, Model of 1912.

NOTE: Issued to organizations equipped with saddles, model of 1912.

TOOLS FOR REPAIRING SNAP FASTENERS.

1 Anvil for Snap Fastener Body.
1 Anvil for Snap Fastener Stud.
1 Stud Set.

FOR SHOES.

2 Neat's-foot Oil, quarts.

FOR BELTS.

50 Eyelets.
50 Washers for Eyelets.

SPARE PARTS (PISTOL).

2 Extractors.
2 Firing Pin Springs.
1 Mainspring.
2 Recoil Springs.
2 Sear Springs.
2 Stock Screws.

TOOLS FOR CLEANING PISTOL.

10 Cleaning Rods.
10 Thong Brushes.
10 Screw Drivers.

The tools named above must be handled carefully and with skill to avoid injuring the heads and threads of screws and defacing other metallic parts.

PARTS WHICH ARE MOST LIABLE TO REQUIRE REPAIR.

BOLT STOP.—Worn by continual contact with bolt.

COCKING PIECE.—Nose worn from neglect to keep it lubricated.

LOWER BAND SWIVEL AND SCREW.—Screw, if not riveted in place, works loose and, with swivel, is lost.

SAFETY LOCK.—Thumb piece knocked off by blow.

STACKING SWIVEL AND SCREW.—Screw, if not riveted, works loose and, with swivel, is lost.

STOCK.—Bruises, cuts, pieces chipped from different points, broken at small.

STRIKER.—Point burned by defective cartridge, or broken at the joint hole by snapping with the chamber empty.

REPLACING BROKEN PARTS.

BUTT PLATE PIN.—This pin has both ends upset; the burr on one end must be filed off and the pin driven out with a drift; when a new pin is put in, its ends must be upset with light blows of a hammer.

FRONT SIGHT.—The burr on the left side must be filed off and the pin driven out from the left with a drift; when the new front sight is in place, a new pin is driven in from the right and its left end upset with light blows of a hammer.

LOWER BAND SCREW.—This screw, when in place, has its end upset and riveted over the band ear. It should never work loose, if properly assembled, and when it has to be removed to replace an injured swivel the burr on the end should be filed off and the screw taken out, the end being again upset when the screw has been returned to its place.

STACKING SWIVEL SCREW.—As the screw is made long and its end upset, it should be kept well screwed up at all times. It is removed to replace a broken swivel and replaced as explained in preceding paragraph, care being taken to upset the *end* only.

TRIGGER PIN.—This is a straight pin and can be driven in or out from either side.

INJURIES WHICH DO NOT RENDER PARTS UNSERVICEABLE.

BOLT.—The entire flange at front end may be broken off, except a small portion on the opposite side from the extractor hook, which is required to hold, in connection with the extractor hook, the empty case while it is being drawn to the rear for ejection.

If automatic ejection be not considered, the entire flange may be dispensed with.

BUTT PLATE.—Bruises, cuts, or wearing.

BUTT SWIVEL.—Bent.

COCKING PIECE.—Moderate wearing of nose. The nose can wear until raising and lowering the bolt handle fails to cock the piece.

EXTRACTOR.—Moderate wear or break of edge of hook.

FLOOR PLATE.—Bent or bruised

GUARD.—Bent, bruised, or cut.

USING THE RIFLE WHEN CERTAIN PARTS OF THE BOLT AND MAGAZINE MECHANISM ARE WANTING.

The parts not essential, or only so to a degree, are the ejector, safety lock, cut-off, bolt stop, sleeve lock, floor plate, magazine spring, and follower.

In the absence of the ejector, the empty cases drawn to the rear by the extractor can be removed from the receiver by the finger.

The safety lock being merely a precautionary device, its absence does not affect the usefulness of the arm.

In the absence of the cut-off, the arm can be loaded from the magazine, but the magazine can not be held full in reserve; in single loading with the cut-off wanting and magazine empty, the soldier should be instructed to load directly into the magazine, as otherwise the forward motion of the bolt will be stopped by coming in contact with the follower. In this case, care should be taken in drawing the bolt back not to draw it from the receiver.

The absence of the bolt stop and sleeve lock does not affect the usefulness of the arm.

The absence of the floor plate, follower, and magazine spring only prevents the use of the magazine, but does not prohibit the use of the arm as a single-loader. The soldier should be taught to appreciate these facts.

REMARKS.

Complaints have not infrequently been received that a mainspring was too weak to perform its office, when the fault rested with the soldier, who in sighting inadvertently raised the bolt handle with his hand before pulling the trigger, and thus caused the force of the spring to be expended in closing the bolt, instead of in exploding the cartridge.

All cams and bearings should be kept slightly oiled to prevent wear.

When firing many successive rounds care must be taken that unburned grains of powder do not collect and pack in the locking lug recesses of the receiver, as this will interfere with the perfect closing of the bolt. Such accumulations can be blown out from time to time, or, when packed, removed by a knife or the screw driver.

Except when repairs are needed, the following parts will constantly be injured if allowed to be dismounted by the soldier for cleaning; and when repairs are necessary, they should be removed only by a company artificer, or some one familiar with the handling of tools and delicate mechanisms, viz: Bolt stop, cut-off, safety lock, sleeve lock, front sight, movable stud, lower band, upper band, and stacking swivel screws.

Unless the screw driver is handled carefully, and with some skill, the screws are sure to be injured either at the head or thread.

The BULLET JACKET EXTRACTOR is shown in Figs. 146, 147, and 148. This extractor consists of a steel cylindrical plug provided with lands and grooves on the sides. To use the extractor, it is inserted in the muzzle of the barrel hollow end (see Fig. 149) first. The extractor is then urged down the barrel by pressure applied with the cleaning rod until the jacket and extractor fall out into the chamber. (See arm repair chest, model of 1910, pages 44–46.)

Fig. 146. Fig. 147. Fig. 148.



Fig. 149.

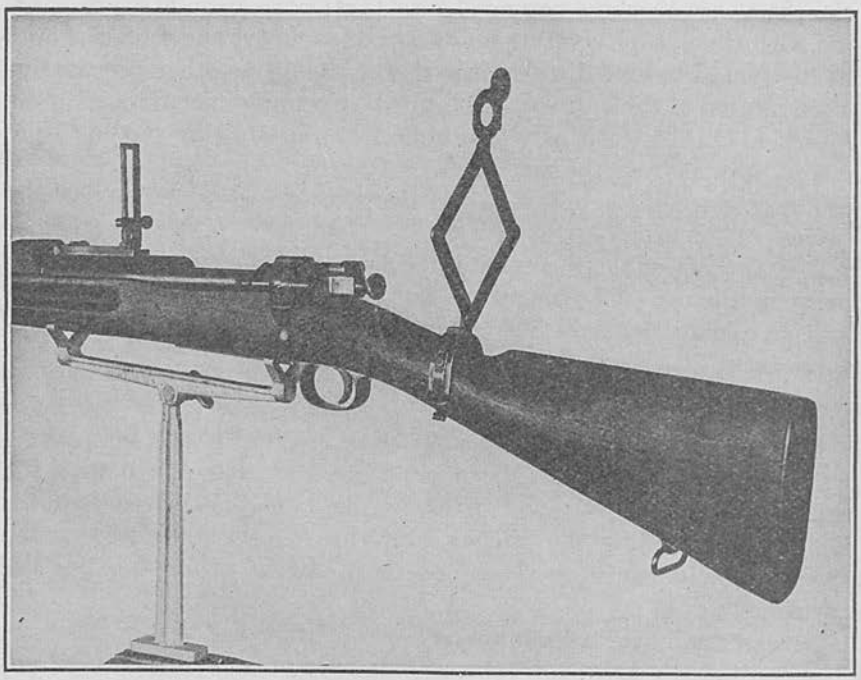
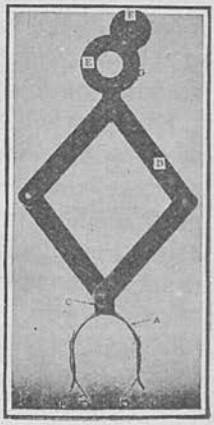


Fig. 150.



1. The AIMING DEVICE, Fig. 149, in place on the rifle, and Fig. 150 in detail, is intended for use in aiming drill and is issued to infantry, cavalry, and engineers at the rate of four per company. With this device the instructor may give a visual demonstration and thereby convince the soldier of the errors made in aiming.

2. The device consists of *yoke* A, which by means of the *spring clips* B embraces the small of the stock, the *bracket* C to which the collapsible *arms* D are held, and the *eye* E, which is closed by the *shutter* F. The eye is provided with a *stop pin* G to hold the shutter in an open position.

Tension washers are furnished for the joints to lend stiffness to the mechanism.

3. To use the device it should be seated firmly on the rifle at the small of the stock. The rifle should then be placed on an improvised rest, or aiming stand. The instructor sights the rifle very accurately, bringing the point of aim, the front sight, rear sight, and the pin hole in the *shutter* F, all into line. Then he throws back the shutter of the aiming device so as to expose the large aperture in the *eye* E. He requires the recruit to verify the sight setting.

4. Then the instructor may change the position of the rifle either slightly or considerably and require the recruit to explain how the line of sight lies with reference to the point of aim, or if very wide of the mark he may direct him to sight the piece and bring the line of sight back on the mark. The recruit uses only the large aperture, which is practically the same as if he did not have the aiming device at all. The instructor then drops the shutter and shows him conclusively that he has been looking along the right or left side of the front sight, or has failed to look through the middle of the rear sight notch, or has taken a full sight when he said he was taking a half sight, etc.

TOOL ROLLS have been issued to post and regimental supply officers and coast defense ordnance officers, containing a breast drill, with reamers, taps, and twist drills, a combination screw driver and wrench, a cold chisel and file, for the purpose of correctly locating the fixed stud, movable stud, and front sight on barrels of rifles in the case of repairs, replacements, etc. This tool roll also contains a rifle bore gage with its container and a defective cartridge extractor.

The use of the rifle BORE GAGE is covered in Par. II, Bulletin No. 15, War Department, 1915, as amended to date.

The DEFECTIVE CARTRIDGE EXTRACTOR is used to remove defective shells from the chamber, the heads of which have been stripped off in firing. The extractor, having the extractor pin pushed to the rear, is inserted in the chamber as far as it will go. The extractor pin is then pushed forward, thus expanding the extractor and gripping the shell. Then the lever is pushed forward, withdrawing the extractor with the shell.

TELESCOPIC SIGHT.—To properly equip a special class of shots, who, in action, may be employed as sharpshooters, especially selected rifles are fitted and targeted with telescopic sights. The rifle should not be separated from its telescopic sight, as both are given the same serial number, are nicely fitted and accurately targeted together, and for manufacturing reasons are not interchangeable. Therefore, in

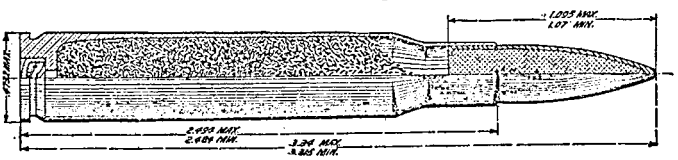
case of repairs to either the sight or rifle, which can not be accomplished in the organization, both the sight and the rifle should be turned in to an arsenal.

AMMUNITION FOR UNITED STATES RIFLE, CALIBER .30, MODEL OF 1903.

BALL CARTRIDGE, MODEL OF 1906.

The CALIBER .30 BALL CARTRIDGE, Fig. 151, consists of the *case, primer, charge of smokeless powder,* and *bullet.* The case is of cartridge brass. It has a conical body joined to the neck by a sharper cone, called the shoulder. The neck is the seat of the bullet and is very nearly cylindrical. The front end of the case is called the mouth and the rear end the head. The mouth edge of the case is crimped on the bullet, when the cartridge is assembled, in order to keep the bullet secure in the case. The head of case is grooved to provide for extraction of cartridge from the chamber of the rifle and is provided with a primer pocket and vent. The initials of the place of manufacture, the number of the month, and the year of its fabrication are stamped on the head of case.

Fig. 151.



The primer consists of the *cup, percussion composition, disk of shellacked paper,* and *anvil.* The cup is of gilding metal and contains 0.46 grain of nonfulminate composition composed of tersulphide of antimony, potassium chlorate, and sulphur. A disk of shellacked paper covers the composition to protect it from moisture and to prevent electrolytic action. The anvil is of brass and is assembled over the paper. After the primer is assembled to the case, a drop of shellac is placed on the head of the primer to make the joint waterproof.

The charge is of pyrocellulose composition very similar to the powders used as propelling charges in field and seacoast guns. The grains are cylindrical, single, perforated, and graphited. The normal charge weighs from 47 to 50 grains, varying with the lot of powder used.

The bullet has a core of lead and tin composition inclosed in a jacket of cupro-nickel. It weighs 150 grains, and the point is much sharper and offers less resistance to the air than that of any previous model in the United States service. The bullet is cannelured to receive the crimp of the case, and the base of the bullet is flat. The

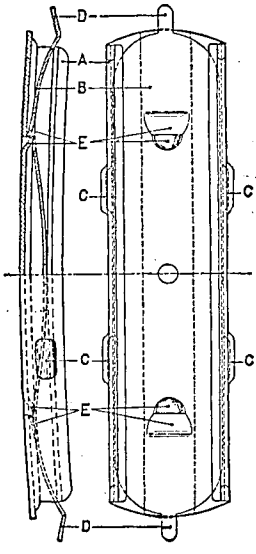
neck of the case is shellacked before loading, and a pressure of at least 75 pounds is required to seat the bullet in the case; this, with the addition of the above-mentioned crimp, makes the case waterproof.

The standard muzzle velocity of this ammunition in the rifle is 2,700 feet per second. The instrumental velocity measured at 78 feet from the muzzle is 2,640 feet per second, with an allowed mean variation of 20 feet per second on either side of the standard.

The cartridge complete weighs about 395.5 grains, its weight varying slightly with variation in the weight of the powder charge.

Five cartridges are packed in a clip.

Fig. 152.



The CLIP, Fig. 152, consists of the *body* A and the *spring* B, both of brass. On the exterior of the sides of the body are the *stop lugs* C, which seat the clip in its slots in the receiver of the rifle. The top edges of the sides are folded inward, forming flanges, which, fitting into the grooves in the heads, hold the cartridges in place. The spring is secured to the bottom of the body by two sets of *interlocking lips* E. The spring is provided with narrow *tongues* D, which, when the clip is filled, are pressed into the grooves of the outside cartridges, holding the cartridges securely in the clip. The clip body can be used a number of times, but the springs only once.

The gallery practice and dummy clip is provided with a strong bronze spring without tongues.

Sixty ball cartridges in 12 clips are packed in a bandoleer.

The bandoleer is made of olive-drab cloth and contains six pockets, each holding two clips. The clips can be readily taken out by forcing back the fold of the pocket.

The bandoleer is provided with a shoulder strap of olive-drab webbing by which it is carried over the shoulder, and a safety pin is provided to afford an adjustment of its length to suit the convenience of the soldier. When packed, the bandoleer weighs about 3.88 pounds.

In each bandoleer is placed an identification card showing the number of cartridges, the caliber and model of ammunition and rifle, place and date of manufacture, kind and lot of powder, and muzzle velocity. The shop symbols of loaders, inspectors, and packers are also given. In case of defective ammunition this card should be returned with report.

Twelve hundred cartridges are packed in a terneplate-lined packing box, hermetically sealed. Each box contains 20 bandoleers of 60 cartridges each. The packing box measures 34.5 by 9.5 by 8.25 inches and weighs about 100 pounds when filled.

The lid is held to the box by five brass bolts and can be easily removed without the use of tools. Two wire seals connect the cover with the sides of the box.

When the lid is removed, the lining may be torn open by means of a wire handle on the metal cover.

A metallic packing chest is also in use. It is made of tinned sheet iron painted olive drab. This chest holds 1,200 cartridges packed in 20 bandoleers of 60 cartridges each. It has a terneplate cover under the lid and is hermetically sealed.

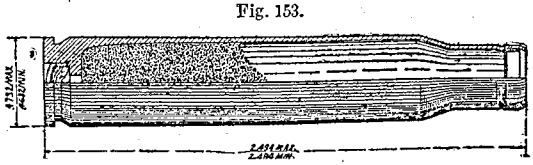
The chest measures 8 by 16¼ by 14 inches and weighs about 95 pounds when filled.

A tin seal locks the hasp to the lid. By opening and closing the fold of this seal several times it will break, thus permitting it to be easily withdrawn. When the lid is opened, the cover can be torn off by means of an iron handle attached thereto.

THE BLANK CARTRIDGE, MODEL OF 1909.

In the manufacture of blank cartridges, Fig. 153, cases are used which have been fired, or which have slight defects, rendering them unsuitable for use in ball cartridges. The charge is 12 grains of "E. C." powder.

Fig. 153.

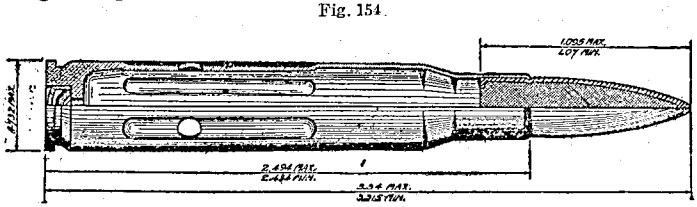


The case is closed by means of a paper cup inserted in the mouth of the case and shellacked to render the ammunition waterproof.

DUMMY CARTRIDGE.

The case of the DUMMY CARTRIDGE, Fig. 154, is tinned and provided with six longitudinal corrugations, also three circular holes in the corrugated portion.

Fig. 154.

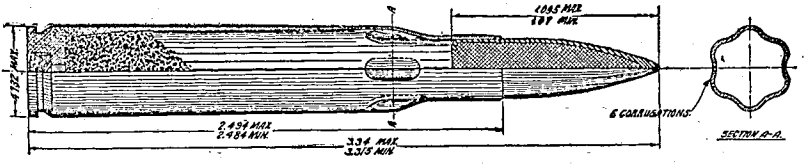


The tinning, corrugations, and holes afford unmistakable means for distinguishing the dummy from the ball cartridge, both by sight and touch. The bullet is the same as in the ball cartridge. The dummy primer has cup and anvil, but no percussion composition.

GUARD CARTRIDGE.

This cartridge, Fig. 155, differs from the ball cartridge in the charge of powder and in the fact that second-class bullets, having slight imperfections, are used. There are six longitudinal corrugations in the case, starting at the shoulder and extending $\frac{3}{16}$ inch, to afford means for distinguishing this cartridge from the ball cartridge by either sight or touch.

Fig. 155.



The charge, about 9.1 grains of bull's-eye powder, or 16.7 grains of Du Pont Rifle Smokeless No. 1, gives a muzzle velocity of 1,200 feet per second. This cartridge gives good results at 100 yards and has sufficient accuracy for use at 150 and 200 yards. The range of 100 yards requires a sight elevation of 450 yards, and ranges of 200 and 300 yards require elevations of 650 and 850 yards, respectively.

VARIATIONS AND CORRECTIONS.

The components of all machine-made ammunition must of necessity vary within certain practicable working limits, and every such variation, especially in the bullet and powder, has a corresponding effect upon the muzzle velocity. The service ammunition is loaded with a charge of powder which gives 2,700 feet per second muzzle velocity when fired from a standard rifle with selected bullets, the powder being at a temperature of 70° F.

The service ammunition will give a muzzle velocity of $2{,}700 \pm 20$ feet per second when fired on a normal day (70° F.). This velocity will vary directly with the temperature (T) 1.5 feet per second per degree. So that this ammunition fired on any but a normal day will give a muzzle velocity of $2{,}700 \pm 20 + (T - 70)$ 1.5 feet per second. Besides the variations due to the ammunition and temperature there are slight variations caused by the rifle which are of no great importance.

Small variations in velocity have small corresponding vertical deviations on the target. For example, at 1,000 yards an extreme vertical deviation of about 20 inches will be due to variations in muzzle velocity and 20 inches more due to other causes. The mean vertical deviation at this range, however, is less than 10 inches.

Another factor entering the question of range is the density of the air. The density of the air varies with the barometer, thermometer, and hygrometer readings.

The appended tables, I, II, III, and IV, will enable a close approximation to be made to the correct sight elevation for a particular condition.

In Table I will be found the value of $\frac{\delta_1}{\delta}$ for different temperatures and pressures of atmosphere. With $\frac{\delta_1}{\delta}$ found in Table I the corresponding elevation for a given range can be found in Table II, which is calculated for different values of $\frac{\delta_1}{\delta}$. With this elevation the corresponding sight elevation can be obtained from Table IV, which gives the range on the sight corresponding to different angles of departure.

Should the temperatures of the day vary to any great extent from 70° F. the corresponding correction can be obtained from Table III. In using these tables, calculations will be sufficiently accurate if interpolations are made by taking the proportional part of the differences in the tables.

The following problem is given as an illustration of the use of these tables:

Range 1,000 yards.
Barometer reading 29 inches.
Temperature 90° F.

From Table I,

$\frac{\delta_1}{\delta} = 1.096.$

From Table II, by interpolating between $\frac{\delta_1}{\delta}=1.05$ and $\frac{\delta_1}{\delta}=1.10$, the elevation for $\frac{\delta_1}{\delta}=1.096$ is found to be 44.690 minutes.

To correct for the muzzle velocity, we have 2,700 feet per second $+(90-70)\ 1.5=2{,}730$.

From Table III,

Interpolating between 2,700 and 2,800, the elevation is 48.198 − 1.093 minutes. Since 48.198 minutes is the elevation for 1,000 yards for 2,700 feet per second muzzle velocity, it is seen that the additional 30 feet per second decreases the elevation by 1.093 minutes. It was found above that the elevation for 2,700 feet per second on this day was 44.690 minutes, so that the elevation for the given conditions is $44.690-1.093=43.597$ minutes, which from Table IV will be found to correspond to a sight elevation of 947 yards. This is subject to a further correction for each particular rifle. For example, if the rifle to which this correction is to be applied requires a sight setting of 1,010 yards under normal conditions, it will be necessary to add 10 yards to the result obtained above, so that the correct setting of this rifle would be 957 yards under the conditions given in the problem.

TABLE I.—VALUE OF $\frac{\delta_1}{\delta}$ FOR TEMPERATURE AND PRESSURE; OF ATMOSPHERE TWO-THIRDS SATURATED WITH MOISTURE.

F.	28 in.	29 in.	30 in.	31 in.	F.	28 in.	29 in.	30 in.	31 in.
0	0.945	0.912	0.882	0.853	23	0.993	0.959	0.927	0.897
1	.947	.914	.884	.855	24	.995	.961	.929	.899
2	.949	.916	.886	.857	25	.997	.963	.931	.901
3	.951	.918	.888	.859	26	1.000	.965	.933	.903
4	.953	.920	.890	.861	27	1.002	.967	.935	.905
5	.955	.922	.892	.863	28	1.004	.969	.937	.907
6	.957	.924	.893	.865	29	1.006	.971	.939	.909
7	.959	.926	.895	.867	30	1.008	.973	.941	.911
8	.962	.928	.897	.869	31	1.010	.975	.943	.912
9	.964	.930	.899	.870	32	1,012	.977	.945	.914
10	.966	.932	.901	.872	33	1.014	.979	.947	.916
11	.968	.935	.903	.874	34	1.016	.981	.949	.918
12	.970	.937	.905	.876	35	1.018	.983	.951	.920
13	.972	.939	.907	.878	36	1.021	.986	.953	.922
14	.974	.941	.909	.880	37	1.023	.988	.955	.924
15	.976	.943	.911	.882	38	1.025	.990	.957	.926
16	.978	.945	.913	.884	39	1.027	.992	.958	.928
17	.981	.947	.915	.886	40	1.029	.994	.960	.930
18	.983	.949	.917	.888	41	1.031	.996	.962	.932
19	.985	.951	.919	.890	42	1.033	.998	.964	.933
20	.987	.953	.921	.891	43	1.035	1.000	.966	.935
21	.989	.955	.923	.893	44	1.037	1.002	.968	.937
22	.991	.957	.925	.895	45	1.040	1.004	970	.939

TABLE I.—VALUE OF $\frac{\delta_1}{\delta}$ FOR TEMPERATURE AND PRESSURE; OF ATMOSPHERE TWO-THIRDS SATURATED WITH MOISTURE—Contd.

F.	28 in.	29 in.	30 in.	31 in.	F.	28 in.	29 in.	30 in.	31 in.
46	1.042	1.006	0.972	0.941	74	1.101	1.063	1.027	0.995
47	1.044	1.008	.974	.943	75	1.103	1.065	1.029	.996
48	1.046	1.010	.976	.945	76	1.105	1.067	1.031	.998
49	1.048	1.012	.978	.947	77	1.107	1.069	1.033	1.000
50	1.050	1.014	.980	.949	78	1.109	1.071	1.035	1.002
51	1.052	1.016	.982	.951	79	1.111	1.073	1.037	1.004
52	1.054	1.018	.984	.953	80	1.113	1.075	1.039	1.006
53	1.056	1.020	.986	.954	81	1.116	1.077	1.041	1.008
54	1.058	1.022	.988	.956	82	1.118	1.079	1.043	1.010
55	1.061	1.024	.990	.958	83	1.120	1.081	1.045	1.012
56	1.063	1.026	.992	.960	84	1.122	1.083	1.047	1.014
57	1.065	1.028	.994	.962	85	1.124	1.085	1.049	1.016
58	1.067	1.030	.996	.964	86	1.126	1.088	1.051	1.017
59	1.069	1.032	.998	.966	87	1.128	1.090	1.053	1.019
60	1.071	1.034	1.000	.968	88	1.130	1.092	1.055	1.021
61	1.073	1.037	1.002	.970	89	1.132	1.094	1.057	1.023
62	1.075	1.039	1.004	.972	90	1.135	1.096	1.059	1.025
63	1.078	1.041	1.006	.974	91	1.137	1.098	1.061	1.027
64	1.080	1.043	1.008	.975	92	1.139	1.100	1.063	1.029
65	1.082	1.045	1.010	.977	93	1.141	1.102	1.065	1.031
66	1.084	1.047	1.012	.979	94	1.143	1.104	1.067	1.033
67	1.086	1.049	1.014	.981	95	1.145	1.106	1.069	1.035
68	1.088	1.051	1.016	.983	96	1.147	1.108	1.071	1.037
69	1.090	1.053	1.018	.985	97	1.149	1.110	1.073	1.038
70	1.092	1.055	1.020	.987	98	1.151	1.112	1.075	1.040
71	1.094	1.057	1.022	.989	99	1.154	1.114	1.077	1.042
72	1.097	1.059	1.024	.991	100	1.156	1.116	1.079	1.044
73	1.099	1.061	1.025	.993					

TABLE II.

[Muzzle velocity, 2,700 feet per second.]

Range.	ANGLE OF DEPARTURES WHEN $\frac{\delta_1}{\delta}$						
	=0.85.	=0.90.	=0.95.	=1.	=1.05.	=1.10.	=1.15.
Yards.	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*
100	0 2.447	0 2.439	0 2.4315	0 2.424	0 2.416	0 2.410	0 2.403
200	0 5.277	0 5.229	0 5.173	0 5.152	0 5.121	0 5.090	0 5.064
300	0 8.585	0 8.466	0 8.365	0 8.275	0 8.192	0 8.118	0 8.051
400	0 12.458	0 12.216	0 12.012	0 11.831	0 11.673	0 11.530	0 11.483
500	0 17.048	0 16.612	0 16.240	0 15.918	0 15.638	0 15.380	0 15.163
600	0 22.483	0 21.766	0 21.170	0 20.650	0 20.186	0 19.775	0 19.420
700	0 28.965	0 27.854	0 26.913	0 26.104	0 25.400	0 24.795	0 24.259
800	0 36.645	0 35.026	0 33.637	0 32.441	0 31.413	0 30.51	0 29.735
900	0 45.617	0 43.378	0 41.447	0 39.785	0 38.334	0 37.069	0 35.961
1,000	0 55.904	0 52.970	0 50.422	0 48.198	0 46.256	0 44.554	0 43.054
1,100	1 7.488	1 3.798	1 1.838	0 57.728	0 55.228	0 53.020	0 51.066
1,200	1 20.369	1 15.856	1 11.881	1 8.379	1 5.265	1 2.497	1 0.040
1,300	1 34.554	1 29.077	1 24.358	1 20.131	1 16.364	1 13.001	1 9.988
1,400	1 50.051	1 43.658	1 38.003	1 32.987	1 28.508	1 24.491	1 20.899
1,500	2 6.938	1 59.433	1 52.815	1 46.951	1 41.937	1 36.997	1 32.760
1,600	2 25.183	2 16.498	2 8.828	2 2.038	1 55.971	1 50.504	1 45.598
1,700	2 44.893	2 34.883	2 26.077	2 18.272	2 11.300	2 5.035	1 59.405
1,800	3 6.100	2 54.625	2 44.575	2 35.674	2 27.708	2 20.591	2 14.187
1,900	3 28.92	3 15.754	3 4.362	2 54.277	2 45.274	2 37.207	2 29.951
2,000	3 53.408	3 38.504	3 25.540	3 14.111	3 3.985	2 54.904	2 46.738

TABLE III.

Range.	Angle of Departure when $\frac{\partial_1}{\partial}=1$. M. V.=2,600 f. s. $\phi=$	M. V.=2,700 f. s. $\phi=$	M. V.=2,800 f. s. $\phi=$	Range.	Angle of Departure when $\frac{\partial_1}{\partial}=1$. M. V.=2,600 f. s. $\phi=$	M. V.=2,700 f. s. $\phi=$	M. V.= 2,800 f. s. $\phi=$
Yards.	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*	*Yards.*	*Deg. Min.*	*Deg. Min.*	*Deg. Min.*
100	0 2.612	0 2.424	0 2.251	1,100	1 2.394	0 57.728	0 53.447
200	0 5.573	0 5.152	0 4.790	1,200	1 13.696	1 8.379	1 3.427
300	0 8.941	0 8.275	0 7.668	1,300	1 26.106	1 20.131	1 14.575
400	0 12.806	0 11.831	0 10.959	1,400	1 39.633	1 32.987	1 26.783
500	0 17.248	0 15.918	0 14.736	1,500	1 54.266	1 46.951	1 40.108
600	0 22.378	0 20.650	0 19.091	1,600	2 10.050	2 2.038	1 56.386
700	0 28.315	0 26.104	0 24.120	1,700	2 26.985	2 18.272	2 10.070
800	0 35.205	0 32.441	0 29.956	1,800	2 45.099	2 35.674	2 26.790
900	0 43.152	0 39.785	0 36.734	1,900	3 4.429	2 54.277	2 44.689
1,000	0 52.206	0 48.198	0 44.552	2,000	3 25.03	3 14.111	3 3.793

TABLE IV.—ANGLE OF DEPARTURE FOR EVERY 25 YARDS FROM 100 TO 2,000 WHEN

$$\frac{\partial_1}{\partial}=1.$$

[Showing the relation between the range marked on sight and angle of departure as computed.]

Range.	Angle of departure.	Range.	Angle of departure.	Range.	Angle of departure.	Range.	Angle of departure.
Yards.	*Deg. Min.*	*Yards.*	*Deg. Min.*	*Yards.*	*Deg. Min.*	*Yards.*	*Deg. Min.*
100	0 2.424	650	0 23.273	1,200	1 8.379	1,750	2 26.824
125	0 3.073	675	0 24.660	1,225	1 11.150	1,775	2 31.211
150	0 3.744	700	0 26.104	1,250	1 14.112	1,800	2 35.674
175	0 4.434	725	0 27.602	1,275	1 17.080	1,825	2 40.211
200	0 5.152	750	0 29.158	1,300	1 20.131	1,850	2 44.823
225	0 5.894	775	0 30.767	1,325	1 23.238	1,875	2 49.511
250	0 6.664	800	0 32.441	1,350	1 26.421	1,900	2 54.277
275	0 7.454	825	0 34.181	1,375	1 29.665	1,925	2 59.111
300	0 8.275	850	0 35.984	1,400	1 32.987	1,950	3 4.032
325	0 9.119	875	0 37.851	1,425	1 36.368	1,975	3 9.028
350	0 9.996	900	0 39.785	1,450	1 39.828	2,000	3 14.111
375	0 10.897	925	0 41.786	1,475	1 43.355		
400	0 11.831	950	0 43.852	1,500	1 46.951		
425	0 12.800	975	0 45.991	1,525	1 50.618		
450	0 13.800	1,000	0 48.198	1,550	1 54.354		
475	0 14.844	1,025	0 50.482	1,575	1 58.158		
500	0 15.918	1,050	0 52.826	1,600	2 2.038		
525	0 17.036	1,075	0 55.241	1,625	2 5.982		
550	0 18.194	1,100	0 57.728	1,650	2 10.003		
575	0 19.402	1,125	1 0.290	1,675	2 14.098		
600	0 20.650	1,150	1 2.916	1,700	2 18.272		
625	0 21.943	1,175	1 5.615	1,725	2 22.512		

EXTERIOR BALLISTICS.

RAPIDITY OF FIRE.

Twenty-three aimed shots have been fired in one minute with this rifle, used as a single-loader, and 25 shots in the same time, using magazine fire.

Firing from the hip without aim, 30 shots have been fired in one minute, using rifle as a single-loader, and 40 shots in one minute, using magazine fire.

MAXIMUM RANGE.

[Computed.]

Maximum range.	Elevation.	Time of flight.
4,891.6 yards.	45 degrees.	38.058 seconds.

PRESSURE.

The powder pressure in the chamber of this rifle is about 51,000 pounds per square inch.

RECOIL.

[Computed.]

The maximum energy of free recoil of this rifle is 14.98 foot-pounds.

ACCURACY.

[As determined by firings to date.]

Range, yards.	Deviation.		
	Mean vertical.	Mean horizontal.	Mean radius.
	Inches.	*Inches.*	*Inches.*
100	0.6	0.6	0.8
200	1.1	1.1	1.5
300	1.7	1.7	2.3
400	2.3	2.3	3.2
500	3.0	3.0	4.1
600	3.6	3.6	5.0
700	4.3	4.3	6.0
800	5.0	5.0	7.1
900	5.9	5.8	8.3
1,000	6.5	6.4	9.6

PENETRATION.

Material.	Penetration.			
	50 feet.	100 yards.	500 yards.	1,000 yards.
	Inches.	*Inches.*	*Inches.*	*Inches.*
White-pine butts made of 1-inch boards placed 1 inch apart	59. 93	52. 8	26. 36	10. 48
Moist sand	10. 06	14. 02	16. 1	13. 9
Dry sand	6. 32	6. 88	13. 12	10. 86
Loam practically free from sand	19. 9	17. 46	23. 62	17. 46
Thoroughly seasoned oak across the grain	34. 19	31. 18	14. 328	.....
Brick wall	.....	5. 5	.....	.....
Low steel (boiler plate)	. 528	. 40	. 1	. 0

POINT BLANK DANGER SPACE.

[Battle sight, angle of departure, (ϕ)= 0° 18′ 3.97″.]

Firing position.	Assumed height of line of sight above ground.	Point blank danger space (computed).
	Inches.	*Yards.*
Standing	56	203. 0
Kneeling	30	636. 6
Lying down	12	587. 2
[Barrel horizontal.]		
Standing	56	421. 7
Kneeling	30	324. 3
Prone	12	210. 1

TABLE OF FIRE FOR UNITED STATES RIFLE, CAL. .30, MODEL OF 1903, MODEL OF 1905 SIGHT, AND 1906 AMMUNITION.

[Initial velocity=2,700 feet per second. C=0.3894075, determined experimentally at Frankford Arsenal.]

Range (yards).	Angle of departure (computed).	Time of flight (computed).	Angle of fall (computed).	Remaining velocity (computed).	Summit of trajectory (computed).		Remaining energy (computed).
					Height.	Distance from muzzle.	
	Deg. Min.	*Seconds.*	*Deg. Min.*	*Feet per second.*	*Feet.*	*Yards.*	*Foot-pounds.*
100	0 2.424	0.116	0 2.576	2,465.88	0.0546	50.9	2,034.25
200	0 5.152	.243	0 5.827	2,244.57	0.2409	103.8	1,686.80
300	0 8.275	.384	0 9.978	2,039.10	0.5956	157.52	1,392.15
400	0 11.831	.693	0 15.240	1,846.42	1.1681	211.94	1,141.5
500	0 15.918	.709	0 21.937	1,668.57	2.0356	270.56	932.19
600	0 20.650	.899	0 30.435	1,509.55	3.2733	329.47	762.97
700	0 26.104	1.108	0 41.137	1,361.36	4.9892	390.00	620.52
800	0 32.441	1.340	0 54.543	1,238.25	7.3190	452.23	513.37
900	0 39.785	1.593	1 10.814	1,141.62	10.4340	516.13	436.37
1,000	0 48.198	1.864	1 29.669	1,068.21	14.480	580.70	382.36
1,100	0 57.728	2.153	1 50.917	1,012.17	19.553	643.60	343.02
1,200	1 8.379	2.458	2 14.310	966.25	25.846	706.60	312.60
1,300	1 20.131	2.776	2 39.762	924.99	33.397	767.3	285.23
1,400	1 32.987	3.108	3 7.418	887.71	42.332	826.76	263.65
1,500	1 46.951	3.453	3 37.390	853.05	52.778	885.3	243.65
1,600	2 2.038	3.813	4 9.745	821.59	64.838	943.2	226.01
1,700	2 18.272	4.189	4 44.621	792.20	78.630	1,000.9	210.12
1,800	2 35.674	4.572	5 22.245	765.56	94.262	1,058.5	196.23
1,900	2 54.277	4.977	6 2.746	738.65	111.93	1,116.3	182.68
2,000	3 14.111	5.394	6 46.364	713.53	131.76	11,774.46	170.46
2,100	3 35.247	5.827	7 33.479	689.07	153.98	1,233.2	158.98
2,200	3 57.744	6.277	8 24.208	665.78	178.81	1,292.3	148.41
2,300	4 21.664	6.744	9 18.963	643.50	206.52	1,352.4	138.64
2,400	4 47.091	7.182	10 18.230	622.11	236.58	1,412.67	129.58
2,500	5 14.127	7.734	11 21.568	601.89	271.39	1,473.6	121.29
2,600	5 42.850	8.258	12 30.050	582.58	309.24	1,535.1	113.63
2,700	6 13.303	8.803	13 43.750	564.25	351.13	1,597.3	106.60

2,800	6	45.854	9.370	15	2.970	546.93	397.49	1,660.0	100.15
2,900	7	20.404	9.962	16	29.021	530.66	448.77	1,723.6	94.28
3,000	7	57.175	10.577	17	59.20	514.29	505.48	1,787.7	88.62
3,100	8	36.350	11.219	19	36.801	501.09	568.18	1,852.6	84.07
3,200	9	20.000	11.93	21	26	493	628	1,928	80.97
3,300	10	8	12.65	23	25	485	690	2,005	78.37
3,400	11	0	13.38	25	34	478	757	2,083	76.12
3,500	11	55	14.12	27	53	471	832	2,161	73.91
3,600	12	56	14.88	30	22	464	917	2,239	71.73
3,700	14	0	15.66	33	1	458	1,014	2,318	69.88
3,800	15	8	16.47	35	50	453	1,126	2,397	68.37
3,900	16	20	17.32	38	49	448	1,257	2,477	66.87
4,000	17	37	18.22	41	58	445	1,412	2,557	65.97
4,100	19	0	19.18	46	15	445	1,606	2,637	65.97
4,200	20	32	20.20	49	14	448	1,870	2,718	66.87
4,300	23	16	23.06	52	42	456	2,403	2,800	69.28
4,400	29	59	27.50	60	15	482	3,300	2,903	77.40
4,407	31	45	28.75	62	32	492	3,685	2,925	80.65

TABLE OF FIRE FOR UNITED STATES RIFLE, CAL. .30, MODEL OF 1903, MODEL OF 1905 SIGHT, AND 1906 AMMUNITION—Con.

[Initial velocity=2,700 feet per second. C=0.3894075, determined experimentally at Frankford Arsenal.]

Range (yards).	Angle of departure (computed).	Time of flight (computed).	Angle of fall (computed).	Remaining velocity (computed).	Summit of trajectory (computed).		Remaining energy (computed).
					Height.	Distance from from muzzle.	
	Deg. Min.	*Seconds.*	*Deg. Min.*	*Feet per second.*	*Feet.*	*Yards.*	*Foot-pounds.*
4,407	31 45	28.75	62 32	492	3,685	2,925	80.65
4,400	33 45	30.00	64 20	501	3,878	2,928	83.62
4,300	39 15	32.94	69 50	535	4,708	2,878	95.36
4,200	42 46	34.54	70 52	554	5,160	2,819	102.25
4,100	44 50	35.75	72 25	566	5,550	2,759	106.73
4,000	46 46	36.90	73 47	577	5,845	2,698	110.91
3,900	48 35	37.63	74 59	586	6,105	2,636	114.40
3,800	50 18	38.26	76 02	595	6,350	2,573	117.95
3,700	51 56	38.87	76 57	603	6,565	2,510	121.14
3,600	53 29	39.48	77 45	611	6,762	2,446	124.37
3,500	54 58	40.05	78 28	618	6,943	2,382	127.24
3,400	56 23	40.51	79 07	625	7,110	2,317	130.14
3,300	57 45	40.98	79 42	631	7,264	2,252	132.65
3,200	59 4	41.45	80 14	636	7,406	2,186	134.76
3,100	60 20	41.85	80 43	640	7,537	2,119	136.46
3,000	61 34	42.20	81 10	644	7,659	2,051	138.17
2,900	62 46	42.52	81 35	648	7,774	1,983	139.89
2,800	63 56	42.87	81 59	652	7,883	1,915	141.63
2,700	65 4	43.20	82 22	655	7,987	1,847	142.93
2,600	66 10	43.51	82 43	659	8,067	1,775	145.68
2,500	67 14	43.80	83 04	664	8,153	1,709	146.89
2,400	68 16	44.03	83 24	666	8,275	1,640	148.66
2,300	69 16	44.22	83 44	671	8,363	1,571	150.00
2,200	70 15	44.43	84 03	674	8,447	1,502	151.34
2,100	71 13	44.62	84 22	678	8,527	1,433	153.15
2,000	72 10	44.80	84 40	681	8,603	1,364	154.51
1,900	73 6	44.98	84 57	683	8,675	1,295	155.41

1,800	74	1	45.12	85	14	685	8,743	1,226	156.32
1,700	74	55	45.30	85	31	686	8,807	1,158	156.78
1,600	75	49	45.52	85	47	687	8,867	1,090	157.24
1,500	76	43	45.70	86	3	688	8,923	1,022	157.70
1,400	77	36	45.86	86	19	689	8,975	954	158.16
1,300	78	29	45.98	86	35	690	9,023	886	158.62
1,200	79	22	46.08	86	51	691	9,067	818	159.08
1,100	80	15	46.16	87	07	692	9,107	750	159.54
1,000	81	8	46.24	87	23	694	9,143	682	160.46
900	82	1	46.30	87	39	695	9,175	614	160.92
800	82	54	46.35	87	55	696	9,203	546	161.38
700	83	47	46.39	88	11	697	9,227	478	161.85
600	84	40	46.43	88	27	698	9,247	410	162.31
500	85	33	46.46	88	43	699	9,263	342	162.78
400	86	26	46.48	88	59	699	9,275	274	162.78
300	87	19	46.50	89	15	699	9,284	206	162.78
200	88	12	46.52	89	31	699	9,290	138	162.78
100	89	5	46.53	89	47	699	9,294	70	162.78

ORDINATES OF TRAJECTORY ABOVE LINE OF SIGHT.

[Computed.]

Horizontal distance (yards).	100 yards.	200 yards.	300 yards.	400 yards.	500 yards.	600 yards.	700 yards.	800 yards.	900 yards.	1,000 yards.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
100	0	.....	.....	.....	.....	.....	.....	.....	.....	.....
200	.238	0	.....	.....	.....	.....	.....	.....	.....	.....
300	.511	.545	0	.....	.....	.....	.....	.....	.....	.....
400	.821	1.165	.931	0	.....	.....	.....	.....	.....	.....
500	1.178	1.879	2.001	1.427	0	.....	.....	.....	.....	.....
600	1.591	2.705	3.240	3.078	2.065	0	.....	.....	.....	.....
700	2.067	3.657	4.668	4.982	4.444	2.855	0	.....	.....	.....
800	2.619	4.762	6.326	7.194	7.021	6.173	3.871	0	.....	.....
900	3.260	6.045	8.249	9.758	10.413	10.018	8.357	5.127	0	.....
1,000	3.994	7.513	10.452	12.695	14.085	14.423	13.496	11.000	6.607	0
1,100	4.827	9.177	12.947	16.022	18.243	19.413	19.317	17.652	14.090	8.314
1,200	5.756	11.036	15.736	19.740	22.891	24.991	25.824	25.088	22.455	17.607
1,300	6.782	13.088	18.814	23.844	28.020	31.146	33.004	33.293	31.685	27.861
1,400	7.905	15.333	22.182	28.334	33.632	37.879	40.859	42.270	41.782	39.079
1,500	9.126	17.775	25.844	33.216	39.735	45.202	49.400	52.029	52.760	51.274
1,600	10.442	20.408	29.794	38.483	46.317	53.100	58.615	62.560	64.605	64.434
1,700	11.861	23.245	34.049	44.156	53.408	61.608	68.540	73.901	77.362	78.606
1,800	13.381	26.287	38.611	50.238	61.009	70.729	79.182	86.060	91.038	93.797
1,900	15.009	29.541	43.492	56.745	69.143	80.488	90.563	99.066	105.66	110.05
2,000	16.745	33.013	48.699	63.686	77.820	90.897	102.70	112.94	121.27	127.38
2,100	18.596	36.714	54.250	71.088	87.069	101.99	115.65	127.73	137.91	145.86
2,200	20.567	40.657	60.164	78.971	96.921	113.81	129.44	143.48	155.62	165.54
2,300	22.666	44.853	66.457	87.362	107.40	126.39	144.11	160.25	174.48	186.48
2,400	24.898	48.978	73.152	96.287	118.48	139.68	159.61	177.96	200.20	209.09
2,500	27.276	54.072	80.284	105.79	124.55	154.03	176.34	197.08	215.89	232.48
2,600	29.805	59.130	87.869	115.90	143.08	169.19	194.03	217.28	238.61	257.71
2,700	32.498	64.516	95.946	126.67	156.53	185.33	212.85	238.78	262.80	284.57
2,800	35.368	70.255	104.55	138.14	170.87	202.53	232.91	261.70	288.56	313.18
2,900	38.517	76.375	113.73	150.37	186.16	220.87	254.30	286.13	316.03	343.68
3,000	41.695	82.906	123.52	163.43	202.47	240.44	277.12	312.20	345.34	376.23
3,100	45.185	89.885	133.99	177.38	219.90	261.35	301.50	340.05	376.66	411.00

ORDINATES OF TRAJECTORY ABOVE LINE OF SIGHT—Continued.

[Computed.]

Horizontal distance (yards).	1,100 yards.	1,200 yards.	1,300 yards.	1,400 yards.	1,500 yards.	1,600 yards.	1,700 yards.	1,800 yards.	1,900 yards.	2,000 yards.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
100										
200										
300										
400										
500										
600										
700										
800										
900										
1,000										
1,100	0									
1,200	10.221	0								
1,300	21.499	12.301	0							
1,400	33.838	25.759	14.577	0						
1,500	47.248	40.384	30.415	17.050	0					
1,600	61.723	56.174	47.519	35.467	19.730	0				
1,700	77.309	73.173	65.929	55.288	40.960	22.638	0			
1,800	94.015	91.395	85.666	76.539	63.719	46.906	25.779	0		
1,900	111.88	110.88	106.77	99.258	88.053	72.851	53.328	29.161	0	
2,000	130.95	131.67	129.28	123.49	114.00	100.52	82.711	60.255	32.801	0
2,100	151.30	153.83	153.28	149.32	141.67	130.01	114.03	93.393	67.764	36.779
2,200	172.91	177.43	178.83	176.83	171.12	161.41	147.37	128.67	104.97	75.923
2,300	195.94	202.54	206.02	206.09	202.46	194.81	182.84	166.19	144.55	117.54
2,400	220.43	229.24	234.94	237.22	235.78	230.87	220.55	206.10	186.64	161.80
2,500	246.51	257.68	265.72	270.35	271.25	268.14	260.69	248.56	231.41	208.88
2,600	274.24	287.92	298.46	305.58	308.97	308.34	303.36	293.69	279.00	258.93
2,700	303.77	320.11	333.31	343.08	349.11	351.12	348.77	341.72	329.64	312.17
2,800	335.22	354.40	370.42	383.01	391.87	396.68	397.12	392.86	383.55	368.84
2,900	368.76	390.95	409.99	425.58	437.43	445.22	448.64	447.34	440.99	429.21
3,000	404.44	429.94	452.19	470.99	486.02	496.99	503.58	505.43	502.21	493.55
3,100	442.74	471.59	497.27	519.48	537.92	552.28	562.24	567.44	567.57	562.23

ORDINATES OF TRAJECTORY ABOVE LINE OF SIGHT—Continued.

[Computed.]

Horizontal distance (yards).	2,100 yards.	2,200 yards.	2,300 yards.	2,400 yards.	2,500 yards.	2,600 yards.	2,700 yards.	2,800 yards.	2,900 yards.	3,000 yards.	3,100 yards.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
100											
200											
300											
400											
500											
600											
700											
800											
900											
1,000											
1,100											
1,200											
1,300											
1,400											
1,500											
1,600											
1,700											
1,800											
1,900											
2,000											
2,100	0										
2,200	41.067	0									
2,300	84.735	45.703	0								
2,400	131.16	94.293	50.744	0							
2,500	180.54	145.96	104.69	55.796	0						
2,600	233.02	200.87	162.02	115.53	62.137	0					
2,700	288.85	259.28	223.00	179.06	126.72	68.585	0				
2,800	348.27	321.44	287.87	246.64	198.47	141.53	75.598	0			
2,900	411.56	387.63	356.96	318.60	273.28	218.66	156.04	83.232	0		
3,000	479.03	458.17	430.57	395.25	352.95	301.84	241.69	171.82	91.512	0	
3,100	551.00	533.44	509.09	477.01	437.93	389.99	333.00	266.25	189.02	100.55	0

DANGEROUS SPACES.

[The dangerous spaces were calculated under the assumption that the gun, when fired, is 12 inches above the ground, that the height of a man is 68 inches, that the head of a man on horseback is 8 feet above the ground, and that the gun is aimed at the middle point of the target.]

Rifle against infantry and cavalry.

Distance to target (yards).	Rising branch of trajectory.		Falling branch of trajectory.				Continuous dangerous space at target.		Total.	
			In front of target.		In rear of target.					
	Infantry.	Cavalry.	Infantry.	Cavalry.	Infantry.	Cavalry.	Infantry.	Cavalry.	Infantry.	Cavalry.
	Yards.	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*	*Yards.*
100	All.	All.	All.	All.	582.2	172.6+197.2	682.2	272.6	682.2	469.8
200	All.	All.	All.	All.	340.9	464.2	540.9	664.2	540.9	664.2
300	All.	All.	All.	All.	233.4	318.0	533.4	618.0	533.4	618.0
400	All.	All.	All.	All.	168.7	230.5	568.7	630.5	568.7	630.5
500	All.	All.	All.	All.	125.0	172.0	625.0	672.0	625.0	672.0
600	All.	All.	All.	All.	94.7	130.4	694.7	730.4	694.7	730.4
700	232.7	All.	113.2	All.	72.1	99.9	185.3	799.9	418.0	799.9
800	174.5	273.5	73.4	120.5	55.6	77.3	129.0	197.8	303.5	471.3
900	138.2	210.2	52.6	80.3	43.6	61.0	96.2	141.3	234.4	351.5
1,000	112.4	169.3	39.7	59.0	34.8	48.9	74.5	107.9	186.9	277.2
1,100	93.1	139.7	31.4	45.8	28.3	39.9	59.7	85.7	152.8	225.4
1,200	78.3	117.3	25.5	36.8	23.6	34.7	49.1	71.5	127.4	188.8
1,300	66.7	99.8	21.2	30.4	19.9	28.0	41.1	58.4	107.8	158.2
1,400	57.4	85.8	18.0	25.6	17.0	24.0	35.0	49.6	92.4	135.4
1,500	49.8	74.6	15.3	21.9	14.7	20.8	30.0	42.7	79.8	117.3
1,600	43.7	65.3	13.3	19.0	12.7	18.0	26.0	37.0	69.7	102.3
1,700	38.5	57.7	11.5	16.6	11.3	15.8	22.8	32.4	61.3	90.1
1,800	34.2	51.2	10.4	14.7	9.8	13.9	20.2	28.6	54.4	79.8
1,900	30.5	45.8	9.2	13.0	8.7	12.3	17.9	25.3	48.4	71.1
2,000	27.4	41.1	8.2	11.5	7.8	10.8	16.0	22.3	43.4	63.4
2,100	24.7	37.0	7.8	11.1	6.5	9.2	14.3	20.3	39.0	57.3
2,200	22.4	33.5	7.0	9.9	5.9	8.3	12.9	18.2	35.3	51.7
2,300	20.3	30.5	6.3	8.9	5.2	7.4	11.5	16.3	31.8	46.8
2,400	18.5	27.7	5.7	8.0	4.8	6.7	10.5	14.7	29.0	42.4
2,500	16.9	25.3	5.2	7.3	4.3	6.1	9.5	13.4	26.4	38.7
2,600	15.5	23.2	4.7	6.6	3.9	5.5	8.6	12.1	24.1	35.3
2,700	14.2	21.3	4.3	6.0	3.5	5.0	7.8	11.0	22.0	32.3
2,800	13.0	19.6	3.9	5.5	3.2	4.5	7.1	10.0	20.1	29.6

HORIZONTAL DEVIATION.

The rifle has a right-hand twist, and the drift proper is therefore to the right. There is, however, a slight lateral jump to the left, and the total horizontal deviation of the bullet, excluding wind, is the algebraic sum of the drift and the lateral jump. The trajectory is found to be very slightly to the left of the central or uncorrected line of sight up to a range of 500 yards, and beyond that range to the right of this line. In order to minimize the deviations at the most important ranges, the drift slot on the sight leaf is so cut as to make the trajectory cross the adjusted line of sight at a range of 500 yards. The deviations under these conditions are shown in column (4) of the table below.

This drift and the deviations due to wind, given below, have been determined by experimental firings, up to 2,000 yards.

Range (yards). (1)	Drift with targeted rifles, model of 1905 sights graduated for 1906 ammunition.					Deviation at target produced by a 1-mile wind normal to the plane of fire. (5)
	Total drift. (2)		Drift corrected by sight leaf. (3)		Drift uncorrected (right). (4)	
	Left.	Right.	Left.	Right.		
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*Inches.*
100	0.26	.....	0.26	.....	0.0	0.1
200	0.42	.....	0.42	.....	0.0	0.3
300	0.45	.....	0.45	.....	0.0	0.8
400	0.32	.....	0.32	.....	0.0	1.5
500	0.0	.....	0.0	.....	0.0	2.4
600	.....	0.55	.....	0.55	0.0	3.6
700	.....	2.0	.....	1.4	0.6	5.1
800	.....	4.5	.....	2.6	1.9	6.9
900	.....	8.2	.....	4.2	4.0	9.1
1,000	.....	13.0	.....	6.3	6.7	11.5
1,100	.....	20.5	.....	9.0	11.5	14.3
1,200	.....	29.3	.....	12.3	17.0	17.2
1,300	.....	40.0	.....	16.3	23.7	20.4
1,400	.....	50.7	.....	21.1	29.6	23.8
1,500	.....	61.75	.....	26.75	35.0	27.4
1,600	.....	74.8	.....	33.3	41.5	31.2
1,700	.....	90.0	.....	40.8	49.2	35.2
1,800	.....	107.0	.....	49.3	57.7	39.4
1,900	.....	126.5	.....	59.1	67.4	43.9
2,000	.....	148.5	.....	69.9	78.6	48.6
2,100	.....	174.5	.....	82.1	92.4	53.5
2,200	.....	202.0	.....	95.6	106.4	58.6
2,300	.....	232.0	.....	110.4	121.6	63.8
2,400	.....	264.0	.....	126.7	137.3	69.1
2,500	.....	301.0	.....	145.3	155.7	74.6
2,600	.....	339.0	.....	165.4	173.6	80.0
2,700	.....	381.0	.....	188.1	192.9	84.5
2,800	.....	428.0	.....	212.8	215.2	90.3
2,850	.....	456.0	.....	226.3	229.7	93.2

CORRECTIONS CORRESPONDING TO ONE POINT OF THE DEFLECTION SCALE AND TO A CHANGE IN ELEVATION OF 25 YARDS.

Range (yards).	Correction caused by moving the eyepiece one point.	Correction corresponding to a change in elevation of 25 yards.	Range (yards).	Correction caused by moving the eyepiece one point.	Correction corresponding to a change in elevation of 25 yards.
100	4.31	0.72	1,500	64.66	59.18
200	8.62	1.61	1,600	68.97	68.33
300	12.93	2.77	1,700	73.28	77.79
400	17.24	4.32	1,800	77.59	88.22
500	21.55	6.18	1,900	81.90	98.92
600	25.86	8.54	2,000	86.22	111.45
700	30.17	11.67	2,100	90.53	123.86
800	34.48	15.62	2,200	94.84	136.91
900	38.79	19.76	2,300	99.15	150.62
1,000	43.11	24.81	2,400	103.46	165.96
1,100	47.42	30.87	2,500	107.77	186.09
1,200	51.73	37.09	2,600	112.08	207.29
1,300	56.04	43.89	2,700	116.39	230.64
1,400	60.35	51.82	2,800	120.70	271.07

TABLE SHOWING NUMBER OF POINTS OF DEFLECTION OR WINDAGE NECESSARY TO CORRECT FOR A 10-MILE-AN-HOUR WIND, DRIFT NOT CONSIDERED.

[Computed.]

Range (yards).	Direction of wind.			Range (yards).	Direction of wind.		
	III, IX.	II, IV, VIII, X.	I, V, VII, XI.		III, IX.	II, IV, VIII, X.	I, V, VII, XI.
100	0.23	0.2	0.1	1,600	4.52	3.92	2.26
200	.34	.31	.17	1,700	4.80	4.15	2.40
300	.61	.53	.30	1,800	5.01	4.34	2.50
400	.86	.75	.43	1,900	5.36	4.64	2.68
500	1.11	.96	.55	2,000	5.63	4.87	2.81
600	1.39	1.2	.69	2,100	5.91	5.11	2.95
700	1.68	1.45	.84	2,200	6.17	5.35	3.09
800	2.00	1.73	1.00	2,300	6.44	5.57	3.22
900	2.34	2.03	1.17	2,400	6.67	5.77	3.33
1,000	2.67	2.30	1.33	2,500	6.92	5.99	3.46
1,100	3.01	2.61	1.50	2,600	7.14	6.18	3.57
1,200	3.32	2.88	1.66	2,700	7.26	6.29	3.63
1,300	3.64	3.15	1.82	2,800	7.48	6.48	3.74
1,400	3.94	3.41	1.97	2,850	7.58	6.56	3.79
1,500	4.24	3.66	2.12				

LONGITUDINAL WIND COMPONENTS FOR MODEL OF 1903 RIFLE, 1905 SIGHT, 1906 AMMUNITION (CALCULATED).

[$+\Delta X$=yards short at target on horizontal plane; $-\Delta X$=yards over at target on horizontal plane; $+\Delta Y$=distance above at target in vertical plane; $-\Delta Y$=distance below at target in vertical plane.]

Wind velocities.....	5 miles per hour.				10 miles per hour.				15 miles per hour.			
Direction of wind....	VI.	XII.	VI.	XII.	VI.	XII.	VI.	XII.	VI.	XII.	VI.	XII.
Variation at target...	$+\Delta X$	$-\Delta X$	$+\Delta Y$	$-\Delta Y$	$+\Delta X$	$-\Delta X$	$+\Delta Y$	$-\Delta Y$	$+\Delta X$	$-\Delta X$	$+\Delta Y$	$-\Delta Y$
Range (yards).	*Yards.*	*Yards.*	*Ft. in.*	*Ft. in.*	*Yards.*	*Yards.*	*Ft. in.*	*Ft. in.*	*Yards.*	*Yards.*	*Ft. in.*	*Ft. in.*
100	0.48	0.47	0 0.013	0 0.012	0.97	0.92	0 0.03	0 0.02	1.41	1.40	0 0.04	0 0.0037
200	1.00	1.00	0 .061	0 .060	2.03	2.00	0 .12	0 .11	3.02	3.00	0 .18	0 .18
300	1.59	1.59	0 .203	0 .203	3.22	3.15	0 .41	0 .40	4.76	4.72	0 .61	0 .60
400	2.25	2.23	0 .344	0 .343	4.50	4.40	0 .69	0 .68	6.80	6.60	0 1.05	0 1.02
500	3.06	3.04	0 .702	0 .700	6.1	6.04	0 1.4	0 1.3	9.20	9.03	0 2.10	0 2.07
600	3.99	3.95	0 1.27	0 1.26	8.0	7.9	0 2.5	0 2.4	12.0	11.8	0 3.84	0 3.75
700	5.08	5.02	0 2.19	0 2.16	10.2	9.9	0 4.4	0 4.3	15.3	14.9	0 6.6	0 6.4
800	6.80	6.69	0 3.88	0 3.82	13.6	13.3	0 7.8	0 7.6	20.6	19.9	0 11.8	0 11.3
900	9.85	9.61	0 7.30	0 7.12	19.9	19	1 2.7	1 2.1	30.2	28.2	1 10.0	1 9.0
1,000	13.23	12.91	1 .42	1 .13	26.7	25.5	2 1.1	1 11.9	40.6	37.8	3 2.2	2 11.5
1,100	16.80	16.39	1 7.52	1 7.04	34.0	33.0	3 3.5	3 2.5	51.7	47.9	5 .1	4 7.7
1,200	20.34	20.03	2 4.62	2 4.19	40.9	39.6	4 9.6	4 7.7	61.3	58.6	8 11.9	6 10.5
1,300	22.67	22.39	3 1.96	3 1.50	45.6	44.5	6 4.4	6 2.4	68.9	66.3	9 7.4	9 3.0
1,400	25.14	24.77	4 1.40	4 .70	50.6	49.3	8 3.6	8 .8	76.4	73.4	12 6.2	12 .2
1,500	27.69	27.32	5 3.11	5 2.3	55.7	54.3	10 7.0	10 3.7	84.2	80.8	15 11.9	18 4.3
1,600	30.36	29.94	6 7.50	6 6.4	61.1	59.4	13 4.1	12 11.7	93.5	88.5	20 5.0	19 4.0
1,700	33.03	32.63	8 2.6	8 1.4	66.3	64.7	16 6.2	16 1.4	99.6	96.5	24 9.6	24 .2
1,800	34.98	34.59	9 10.4	9 9.0	70.2	69.1	19 9.6	19 .5	105.7	103.4	29 9.6	29 2.0
1,900	36.93	36.68	11 8.8	11 7.8	74.1	73.1	23 6.6	23 2.6	111.7	109.2	35 5.8	34 8.5
2,000	38.97	38.72	13 10.6	13 9.5	77.1	77.0	27 9.3	27 9.2	117.8	115.2	41 11.0	41 .7
2,100	41.15	40.79	16 4.5	16 2.8	82.5	81.2	32 10.1	32 3.9	124.3	121.4	49 6.0	48 4.0
2,200	43.28	42.94	19 2.0	19 1.4	86.9	85.5	38 5.8	37 10.5	130.9	127.9	57 11.6	56 7.4
2,300	45.54	45.17	22 4.0	22 1.8	91.5	90.0	44 10.2	44 1.5	137.7	134.5	67 6.6	65 11.3
2,400	47.83	47.45	25 10.7	25 8.2	96.1	94.5	52 0.4	51 1.9	144.8	141.2	78 6.5	76 5.1
2,500	50.20	49.78	30 .2	29 9.3	100.8	99.2	60 3.7	59 3.6	151.9	148.2	90 10.0	88 7.2
2,600	52.65	52.18	34 4.3	34 0.6	105.6	103.9	68 11.0	67 10.0	159.3	155.2	103 11.6	101 3.8
2,700	54.98	54.47	39 2.8	38 10.4	110.4	108.4	78 9.4	77 4.5	166.4	161.9	118 8.5	115 6.7
2,800	57.53	56.95	44 8.9	44 3.5	115.6	113.5	89 10.7	88 3.0	174.2	169.4	135 5.7	131 9.5
2,900	60.15	59.53	50 10.8	50 4.6	121.6	118.6	102 10.6	100 4.1	182.2	177.6	154 2.4	150 3.2
3,000	62.82	62.22	57 8.1	57 2.5	126.3	123.8	116 1.6	113 1.0	189.2	184.7	174 .1	169 9.7

LONGITUDINAL WIND COMPONENTS FOR MODEL OF 1903 RIFLE, 1905 SIGHT, 1906 AMMUNITION (CALCULATED)—Contd.

[$+\Delta X$=yards short at target on horizontal plane; $-\Delta X$=yards over at target on horizontal plane; $+\Delta Y$=distance above at target in vertical plane; $-\Delta Y$=distance below at target in vertical plane.]

Wind velocities.....	20 miles per hour.						25 miles per hour.						30 miles per hour.					
Direction of wind....	VI.	XII.	VI.		XII.		VI.	XII.	VI.		XII.		VI.	XII.	VI.		XII.	
Variation at target...	$+\Delta X$	$-\Delta X$	$+\Delta Y$		$-\Delta Y$		$+\Delta X$	$-\Delta X$	$+\Delta Y$		$-\Delta Y$		$+\Delta X$	$-\Delta X$	$+\Delta Y$		$-\Delta Y$	
Range (yards).	*Yards.*	*Yards.*	*Ft.*	*in.*	*Ft.*	*in.*	*Yards.*	*Yards.*	*Ft.*	*in.*	*Ft.*	*in.*	*Yards.*	*Yards.*	*Ft.*	*in.*	*Ft.*	*in.*
100	1.9	1.8	0	0.05	0	0.05	2.4	2.3	0	0.064	0	0.063	2.8	2.7	0	0.08	0	0.07
200	4.0	3.9	0	.20	0	.20	5.0	4.5	0	.31	0	.27	6.0	5.9	0	.40	0	.36
300	6.4	6.3	0	.80	0	.80	8.0	7.8	0	1.03	0	1.00	9.6	9.4	0	1.22	0	1.2
400	8.9	8.8	0	1.4	0	1.3	11.2	11.0	0	1.7	0	1.68	13.5	13.3	0	2.10	0	2.0
500	12.2	12.0	0	2.8	0	2.7	15.4	15.0	0	3.53	0	3.44	18.4	17.9	0	4.20	0	4.1
600	16.0	15.7	0	5.1	0	5.0	20.0	19.6	0	6.39	0	6.23	24.1	23.4	0	7.70	0	7.5
700	20.6	19.8	0	8.7	0	8.0	25.8	24.6	0	11.14	0	10.61	31.2	29.5	1	1.4	1	.7
800	27.8	26.3	1	3.8	1	3.0	35.2	32.8	1	8.1	1	6.7	42.7	37.8	2	0.4	1	9.6
900	40.8	37.2	2	6.2	2	3.6	51.6	46.0	3	2.3	2	10.1	62.7	54.6	3	10.5	3	4.5
1,000	54.8	49.8	4	3.4	3	10.8	69.4	61.6	5	5.2	4	9.8	84.3	73.1	6	7.2	5	8.7
1,100	69.8	63.2	6	9.0	6	1.4	88.4	78.1	8	6.7	7	5.7	107.5	92.6	10	4.9	8	11.6
1,200	82.9	77.2	9	8.7	9	0.6	104.3	95.3	12	2.8	11	2.2	126.1	113.0	14	9.4	13	3.1
1,300	92.6	87.8	12	11.0	12	3.0	116.4	109.1	16	3.0	15	2.6	140.7	130.1	19	7.6	18	1.8
1,400	102.6	97.2	16	9.6	15	10.0	129.1	120.8	21	1.7	19	9.3	156.0	144.1	25	6.6	23	7.1
1,500	113.1	107.0	21	2.7	20	3.9	142.3	133.0	27	.4	25	3.0	172.1	158.5	32	8.3	30	1.3
1,600	124.0	117.2	27	.9	25	7.2	156.1	145.6	34	.9	31	9.4	188.4	173.6	41	1.7	37	10.7
1,700	133.7	127.8	33	3.4	31	9.7	167.7	158.7	41	9.1	39	6.0	202.0	189.1	50	3.6	47	1.0
1,800	141.5	137.3	39	10.9	38	8.8	177.4	170.8	50	.6	48	2.2	213.8	204.0	60	3.6	57	6.5
1,900	149.4	145.1	47	5.8	46	1.3	187.5	180.7	59	6.9	57	5.2	225.9	216.1	71	9.2	68	8.0
2,000	157.7	153.1	56	2.4	54	6.5	196.6	190.7	70	.6	67	10.8	238.5	228.0	84	11.6	81	2.8
2,100	166.4	161.3	66	2.8	64	2.4	208.8	200.9	83	1.2	79	11.6	251.6	240.3	100	1.7	95	7.3
2,200	175.3	169.8	77	7.8	75	2.4	220.0	216.3	97	5.0	95	9.0	265.1	252.9	117	4.6	111	11.4
2,300	184.4	178.6	90	5.3	87	6.9	231.5	222.4	113	6.5	109	0.8	279.0	265.9	136	9.8	130	4.7
2,400	193.8	187.6	104	11.0	101	6.0	243.3	233.5	131	8.4	126	4.9	293.3	279.2	158	9.1	151	1.3
2,500	203.5	196.7	121	8.4	117	8.0	256.0	245.0	153	1.2	146	6.1	307.8	292.8	184	1.8	175	1.0
2,600	213.4	206.1	139	3.2	134	6.4	268.0	256.6	174	1.1	167	6.0	323.1	306.7	210	10.0	200	2.2
2,700	222.9	215.0	159	.4	153	4.9	279.9	267.7	199	8.5	190	11.9	337.5	319.9	240	9.2	228	2.6
2,800	233.4	224.9	181	6.0	174	11.2	293.2	280.0	228	0.1	217	9.4	353.5	334.6	274	11.1	260	2.4
2,900	244.1	235.1	206	7.4	198	11.4	306.7	292.6	259	7.2	247	7.3	369.9	349.6	312	4.4	295	10.3
3,000	255.2	245.4	234	8.4	225	8.4	320.7	305.5	294	10.2	280	1.1	386.9	364.9	357	1.1	335	6.8

PRINCIPAL DIMENSIONS AND WEIGHTS OF UNITED STATES RIFLE, CAL. .30, MODEL OF 1903.

DIMENSIONS.

	Inches.
Barrel:	
Diameter of bore	0.30
Exterior diameter at muzzle	.619
Exterior diameter at breech	1.14
Length of chamber and bore	23.79
Length of travel of bullet in bore	21.697
Diameter of chamber, rear end	.4716
Diameter of chamber, front end	.442
Diameter of neck of chamber, rear end	.3425
Diameter of neck of chamber, front end	.3405
Length of body of chamber	1.793
Length of shoulder of chamber	.16
Length of neck of chamber	.396
Length of chamber, total	2.3716
Rifling:	
Number of grooves, 4.	
Twist, uniform, one turn in	10.00
Width of grooves	.1767
Width of lands	.0589
Depth of grooves	.004
Height of front sight above axis of bore	1.05
Distance from top of front sight to rear side of leaf, leaf raised	22.1254
Stock:	
Length, with butt plate	40.166
Crook, i. e., distance from axis of bore to heel of butt	2.089
Distance from trigger to butt plate	12.74
Length of gun complete	43.212
Sight radius	22.1254
Sight radius (battle sight)	21.5404
Width of single division on windage scale	.0267

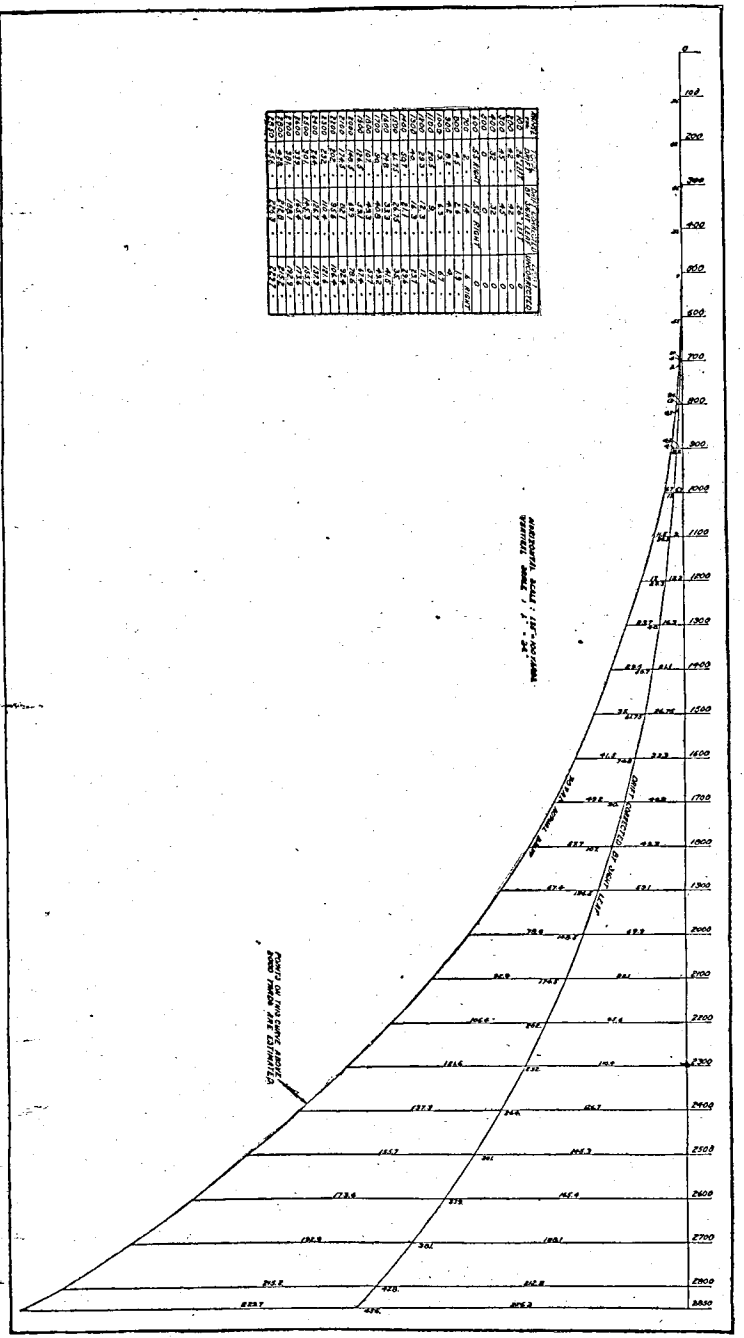
WEIGHTS.

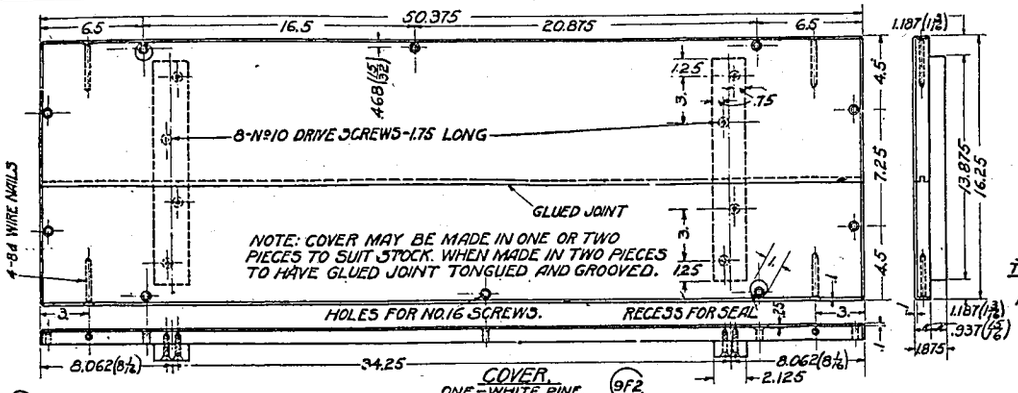
	Pounds.
Barrel	2.79
Barrel, with rear-sight base and front-sight stud	3.00
Butt plate	.26
Receiver	.98
Bolt mechanism	1.00
Magazine and trigger guard	.44
Magazine mechanism, including floor plate	.17
Bayonet	1.00
Stock	1.58
Hand guard	.13
Front and rear bands, including swivels	.25
Rear sight, not including base	.20
Total weight of metal parts	7.30
Oiler and thong case	.19
Total weight of arm, including oiler and thong case, with bayonet	9.69
Total weight of arm, including oiler and thong case, without bayonet	8.69
Weight to compress mainspring	16 to 18
Trigger pull (measured at middle point of bow of trigger)	4 to 5

MISCELLANEOUS DATA.

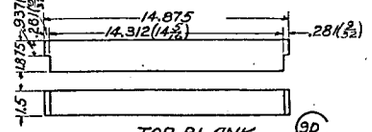
Initial velocity	2,700 feet per second.
Powder pressure in chamber	about 51,000 pounds per square inch.
Weight of ball cartridge	about 395.5 grains.
Weight of bullet	150 grains.
Weight of powder charge	about 50 grains.

PLATE I.


HORIZONTAL SCALE : 1/4" = 100 FEET
VERTICAL SCALE : 1" = 20'
POINTS ON TWO CURVES ABOVE BASE LINE ARE ESTIMATED
FIRST CORRECTED AT LAST LIFT
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2850

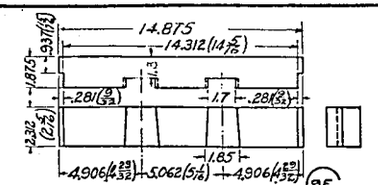


COVER
ONE-WHITE PINE.
SURFACED
(9F2)



TOP BLANK
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
(9D)

COVER CLEAT (9B)
STRIP 2.125 X .937(15/16) X 13.875
TWO-WHITE PINE OR BASSWOOD.
SURFACED.

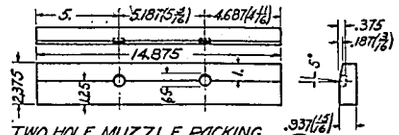


TWO NOTCHED BUTT PACKING
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
(9E)

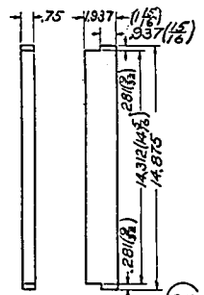
POCKET BOTTOM (9G)
STRIP .5 X 2.375 X 9.375
ONE-WHITE PINE OR BASSWOOD.
SURFACED
FASTENED TO END LINING BY 3-3d WIRE NAILS.

BUTT REST (9A)
STRIP 2.X.375 X 14.312(14 5/16)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
FASTENED TO BOTTOM BY 2-2d WIRE NAILS.

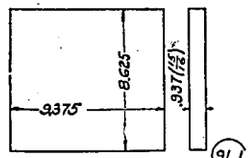
POCKET LINING (9H)
STRIP 4.25 X .187(3/16) X 10.562(10 9/16)
ONE-WHITE PINE OR BASSWOOD.
SURFACED.
FASTENED TO CORNER POSTS BY 6, 2d WIRE NAILS.



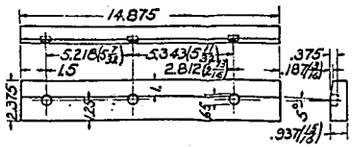
TWO HOLE MUZZLE PACKING
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
(9J)



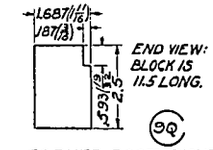
MIDDLE BLANK
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
(9K)



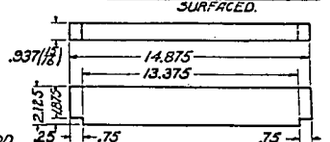
END LINING.
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
HELD TO BOX END BY 8,-5d WIRE NAILS.
(9L)



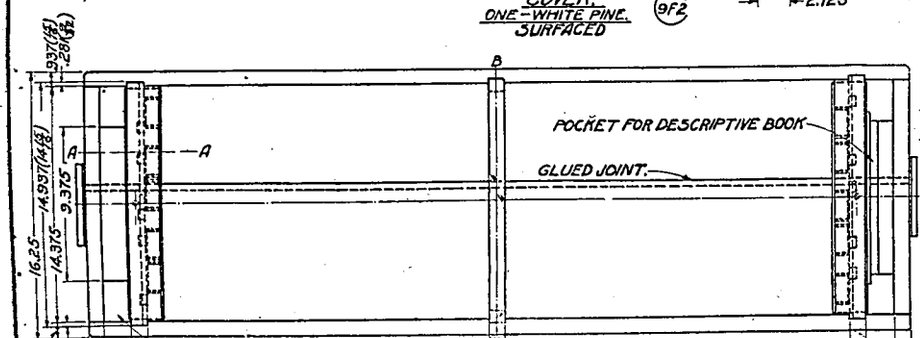
THREE HOLE MUZZLE PACKING (9M)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.



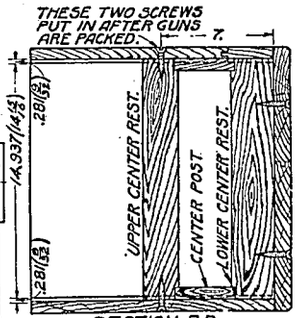
CORNER POST-RIGHT (9Q)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.



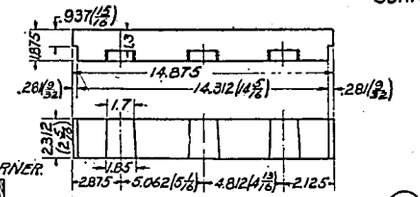
UPPER CENTER REST (9P)
ONE-WHITE PINE OR BASSWOOD.
SURFACED.



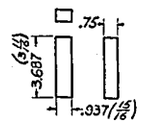
PLAN OF CHEST WITH COVER REMOVED.



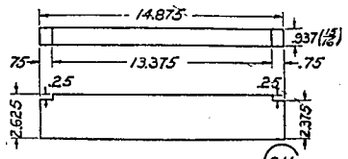
SECTION BB



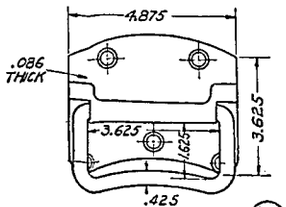
THREE NOTCHED BUTT PACKING (9N)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.



CENTER POST.
TWO-WHITE PINE OR BASSWOOD.
SURFACED.
(9T)

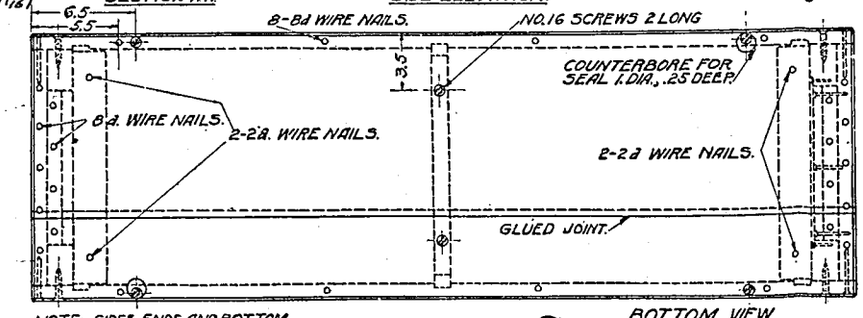


LOWER CENTER REST
ONE-WHITE PINE OR BASSWOOD.
SURFACED.
(9U)



CHEST HANDLE (9W)
TWO-WROUGHT STEEL
JAPANNED.
STANLEY OR EQUAL.

SECTION AA
SIDE ELEVATION.
SECTION CC.



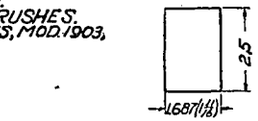
BOTTOM VIEW.

CHEST (9R2)
ONE COMPLETE-WHITE PINE.
SURFACED

NOTE:- SIDES, ENDS AND BOTTOM MAY BE MADE IN ONE OR TWO PIECES EACH, TO SUIT STOCK. WHEN MADE IN TWO PIECES TO HAVE GLUED JOINT TONGUED AND GROOVED. WHERE WIRE NAILS ARE SPECIFIED, BOX NAILS MAY BE USED INSTEAD IF DESIRED.

CONTENTS OF CHEST TO BE LISTED ON EACH END OF CHEST IN ¼ INCH LETTERS, AS FOLLOWS:-
10 U.S. RIFLES, MOD. 1903.
10 OILER AND THONG CASES.
10 THONGS AND THONG BRUSHES.
1 HANDBOOK FOR U.S. RIFLES, MOD. 1903, PAMPHLET NO. 1923.

INSIDE OF CHEST AND COVER TO HAVE ONE COAT OF PRINCE'S METALLIC PAINT. LOOSE PIECES TO BE DIPPED IN LINSEED OIL.

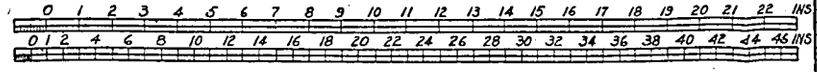


END VIEW: BLOCK IS 11.5 LONG
CORNER POST-LEFT (9X)
TWO-WHITE PINE OR BASSWOOD.
SURFACED.

LIST OF MATERIAL

2	PIECES	50.375	X 16.25 X	.937(15/16)	COVER AND BOTTOM
2	"	50.375	X 12. X	.937(15/16)	SIDES
2	"	14.375	X 12. X	.937(15/16)	ENDS
4	"	11.5	X 2.5 X	1.687(1 11/16)	CORNER POSTS (R & L)
2	"	9.375	X 8.625 X	.937(15/16)	END LINING
1	"	9.375	X 2.375 X	.5	POCKET BOTTOM
1	"	10.562(10 9/16)	X 4.25 X	.187(3/16)	POCKET LINING
2	"	14.312(14 5/16)	X 2. X	.375	BUTT REST
2	"	14.875	X 1.875 X	1.5	TOP BLANK
4	"	14.875	X 2.312(2 5/16) X	1.875	BUTT PACKING
4	"	14.875	X 2.375 X	.937(15/16)	MUZZLE PACKING
2	"	14.875	X 1.937(1 15/16) X	.75	MIDDLE BLANK
1	"	14.875	X 2.625 X	.937(15/16)	LOWER CENTER REST
1	"	14.875	X 2.125 X	.937(15/16)	UPPER CENTER REST
2	"	3.687(3 11/16)	X .937(15/16) X	.75	CENTER POST
2	"	13.875	X 2.125 X	.937(15/16)	COVER CLEAT
28		№2 SCREWS 2. INCHES LONG			
2		№2 SCREWS 1.75 INCHES LONG			

3-3d WIRE NAILS FOR POCKET BOTTOM
50-8d WIRE NAILS FOR BOTTOM AND SIDES AND COVER
16-5d WIRE NAILS FOR END LINING
8-№10, DRIVE SCREWS, 1.75 LONG
10-2d WIRE NAILS FOR BUTT REST & POCKET LINING
28-6d WIRE NAILS FOR BOX ENDS
2-CHEST HANDLES
10-№13 X 1. WOOD SCREWS FOR HANDLES



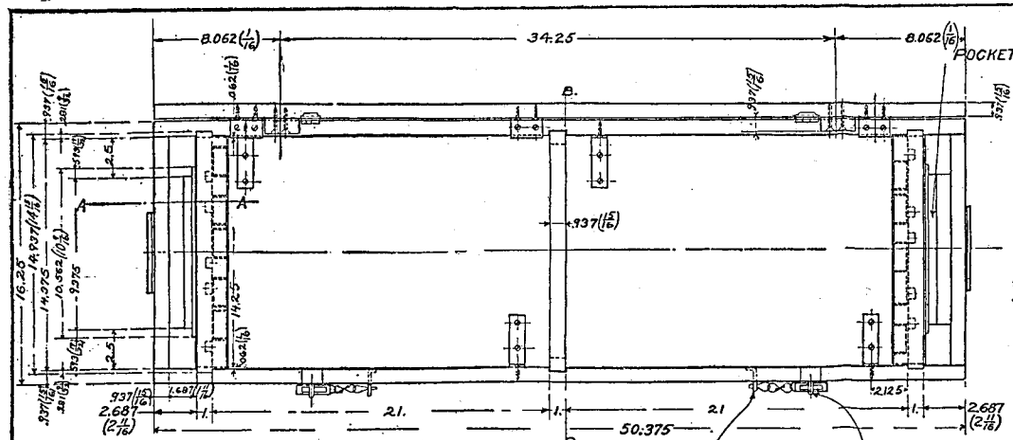
DR'G. PERTAINS TO		REVISIONS	
CLASS	DIV.		
		15	AUG. 25, 1917
		16	OCT. 8, 1917
		17	APR. 17, 1918

ARM CHEST FOR 10 UNITED STATES RIFLES, MODEL OF 1903.

MAY 25 1905

SUBMITTED: Eckfeldt, LT. ORDNANCE DEPARTMENT U.S.A.
EXAMINED: Lee O. Wright, CAPT. ORDNANCE DEPARTMENT U.S.A.
APPROVED BY ORDER OF THE CHIEF OF ORDNANCE: Jno. T. Thompson, COL. U.S. ARMY, RETIRED, CHIEF OF ORDNANCE

CLASS 49 | DIVISION 1 | DRAWING 9 | FILE

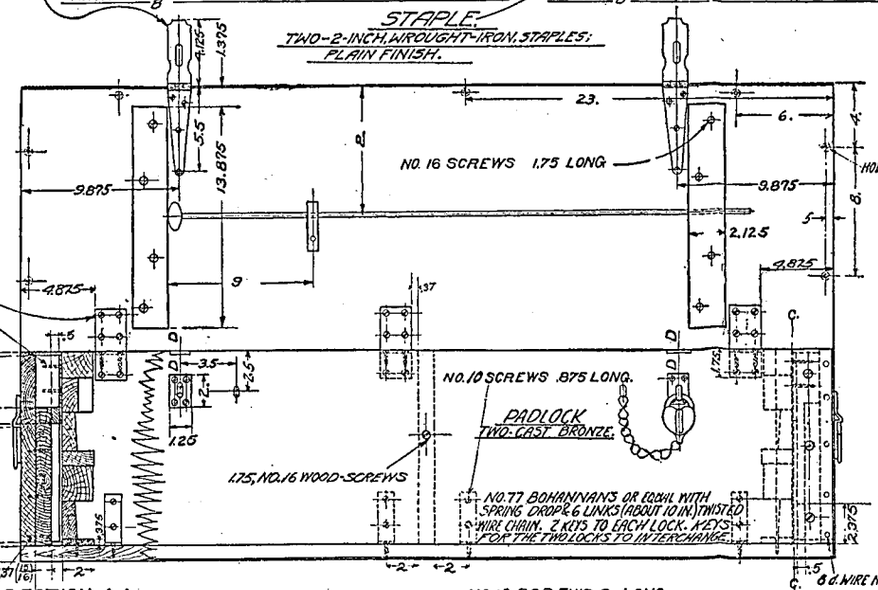


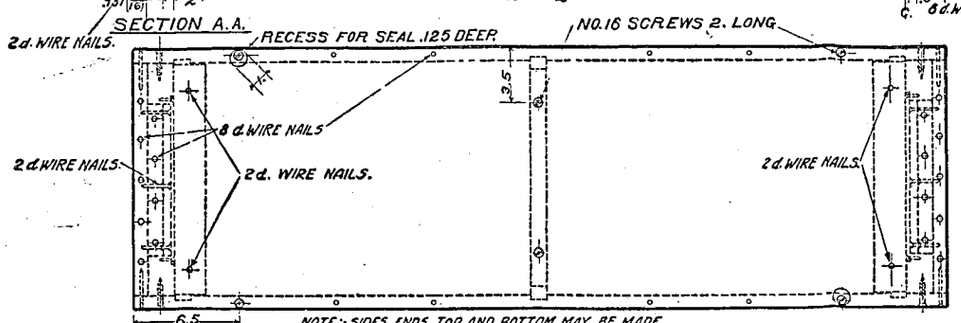
HINGE HASP.
TWO - PLAIN, WROUGHT STEEL, WIDTH 1.5, 6-INCH, WITH FOUR 7/8-INCH WOOD-SCREWS, TO SUIT HARDWARE.

HINGE HASP STAPLE
TWO - PLAIN, WROUGHT STEEL, 1 1/2 X 1 1/2, WITH FOUR 7/8-INCH WOOD SCREWS, TO SUIT HARDWARE.

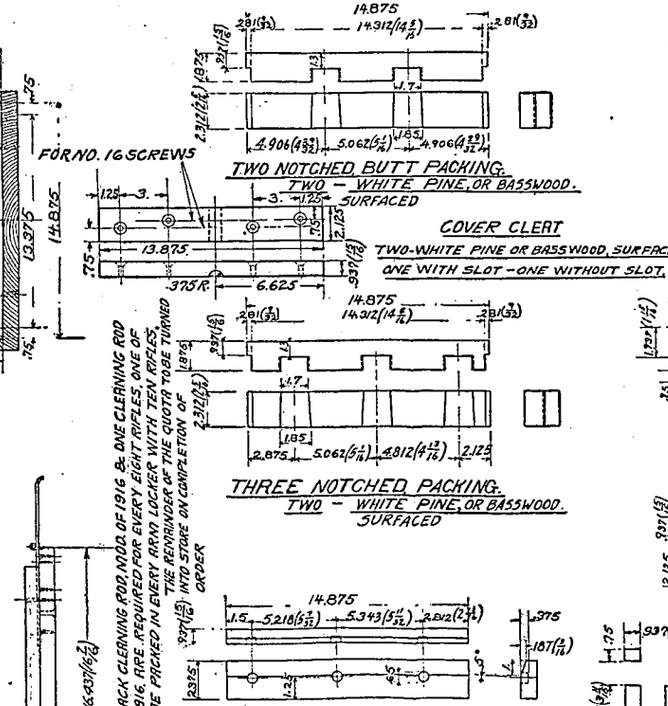
HINGE.
THREE-STEEL STANLEY WORKS, NO. 820 OR EQUAL WITH .875 FLAT HEAD, BRIGHT WOOD-SCREWS, TO FIT HARDWARE.

STAPLE.
TWO-2-INCH, WROUGHT-IRON, STAPLES; PLAIN FINISH.



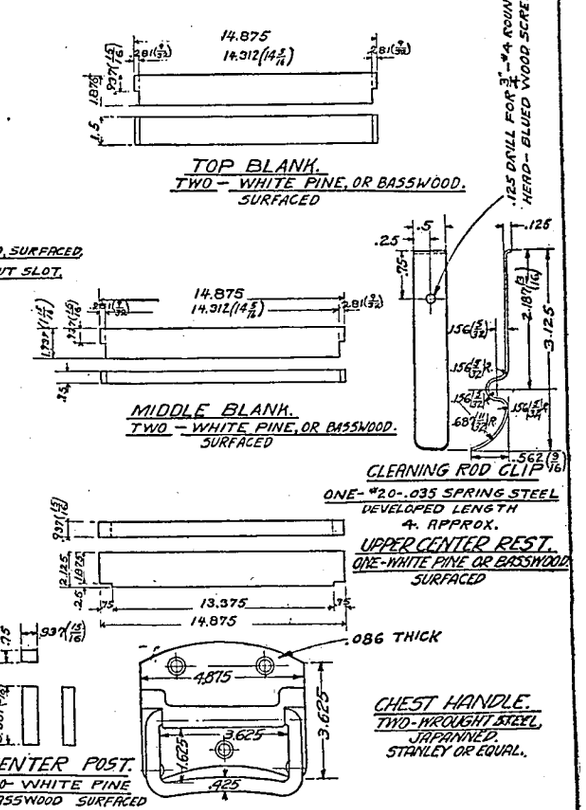


NOTE:- SIDES, ENDS, TOP AND BOTTOM MAY BE MADE IN ONE OR TWO PIECES TO SUIT STOCK. WHEN MADE IN TWO PIECES TO HAVE GLUED JOINT TONGUED AND GROOVED.



LOCKER
ONE - COMPLETE - WHITE PINE, - SURFACED.
NOTE, CORNER POSTS ARE SPRUCE. OR BASSWOOD.

'INSIDE' OF LOCKER 'EXCEPT COVER TO HAVE ONE COAT OF METALLIC PAINT.
COVER AND OUTSIDE OF LOCKER TO HAVE TWO COATS OF OLIVE-DRAB PAINT.
LOOSE PIECES TO BE DIPPED IN LINSEED OIL.



EACH ARM LOCKER FOR 10 UNITED STATES RIFLES MOD. OF 1903, CONTAINS.
1 - BARRACK CLEANING ROD, MOD. OF 1916.
10 - U.S. RIFLES, CAL. 30 MOD. OF 1903
10 - FRONT SIGHT COVERS
2 - SCREW-DRIVERS.
5 - OILER AND THONG CASES
5 - THONGS AND THONG BRUSHES
2 - DRIFT SLIDES NO. 4.
2 - DRIFT SLIDES NO. 6.
1 - BOOK, "DESCRIPTION AND RULES FOR THE MANAGEMENT OF THE UNITED STATES RIFLE, CAL. 30, MOD. OF 1903," FORM 1923.
1 - CLEANING ROD, MOD. OF 1916, AND CLEANING ROD CASE, MOD. OF 1916.
5 - SPARE PART CONTAINERS WITH CONTENTS.

BILL OF MATERIAL.

2 - PIECES	50.375 X 16.25 X .937 (15/16)	COVER & BOTTOM.
2 - "	50.375 X 12. X .937 (15/16)	SIDES.
2 - "	14.375 X 12. X .937 (15/16)	ENDS.
4 -	11.5 X 2.5 X 1.687 (1 11/16)	CORNER POSTS
2 -	9.375 X 8.625 X .937 (15/16)	END LININGS.
1 -	9.375 X 2.375 X .5	POCKET BOTTOM.
1 -	9.375 X " X .5	FILLING PIECE.
2 -	10.562 (10 9/16) X 4.25 X .187 (3/16)	POCKET LININGS.
2 -	14.312 (14 5/16) X 2.5 X .375	BUTT REST.
2 -	14.875 X 1.875 X 1.5	TOP BLANKS.
4 -	14.875 X 2.312 (2 5/16) X 1.875	BUTT PACKINGS
4 -	14.875 X 2.375 X .937 (15/16)	MUZZLE PACKINGS.
2 -	14.875 X 1.937 (1 15/16) X .75	MIDDLE BLANKS.
1 -	14.875 X 2.625 X .937 (15/16)	LOWER CENTER REST.
1 -	14.875 X 2.125 X .937 (15/16)	UPPER CENTER REST.
2 -	3.687 (3 11/16) X .937 (15/16) X .75	CENTER POSTS.
2 -	13.875 X 2.125 X .937 (15/16)	COVER CLEATS.
2 -	CHEST HANDLES.	
2	15" G. HINGE HASPS.	
2	1.25 X 1.875 HINGE HASP STAPLES.	
3 - 2 IN.	STANLEY NO. 820 OR EQUAL CHEST HINGES.	
2 -	PADLOCKS, BOHANNANS NO. 77 WITH SPRING DROP AND CHAIN. 2 KEYS TO EACH LOCK, KEYS FOR THE TWO LOCKS TO INTERCHANGE.	
2 - 2 IN.	WROUGHT STEEL STAPLES.	
4 - PIECES	4.562 (4 9/16) X 1.25 X .125	STEEL FOR BRACES.

BILL OF MATERIAL, CONT.

28 - NO. 16	WOOD SCREWS 2. LONG, FLAT HEAD BRIGHT
10 - NO. 16	" " 1.75 " " " "
56 - NO. 10	" " .875 " " " "
92 - 2d.	WIRE NAILS FOR BUTT REST & POCKET BOTTOM.
96 - 10d.	" " " BOTTOM AND SIDES.
16 - 5d.	" " " END LININGS.
28 - 6d.	" " " BOX ENDS.
10 - 93 X 1 - IN.	WOOD-SCREWS FOR HANDLES.
1 -	CLEANING ROD CLIP.
1 - " 4 - X .75	ROUND HD. WOOD SCREW - BLUED.

DR'G PERTAINS TO			REVISIONS
CLASS	DIV.	AS PLATE	JUNE 1, 1908.
			SEPT. 28, 1909.
			DEC. 20, 1910.
			JUNE 15, 1912.
			OCT. 23, 1913.
			MAY 14, 1915.
			DEC. 21, 1916.
			JULY 21, 1917.
			OCT. 10, 1917.
			NOV. 30, 1917.
			FEB. 14, 1918.

ARM LOCKER FOR U.S. RIFLE. MODEL OF 1903.
SPRINGFIELD ARMORY, U. S. A., JUNE 13, 1906

SUBMITTED: Milford Hawkins, ASST. ORDNANCE DEPARTMENT, U. S. A.
EXAMINED: Frank K. Ross, COLONEL, ORD. DEPT., U. S. A., COMMANDING.
APPROVED: William Crozier, BRIG. GEN., CHIEF OF ORDNANCE, U. S. A.

CLASS 49 | DIVISION 1 | DRAWING 10 | FILE

PLATE

INDEX.

	Page.
Accessories:	
Description	26–27
List	6
Repair, spare parts for	44
Aiming device	50
Ammunition:	
Cartridges—	
Ball, model of 1906	52
Blank, model of 1909	54
Dummy	54
Guard	55
Variations and corrections	55
Appendages:	
Description	25
List	6
Repair, spare parts for	44
Arm chest	41
Arm locker	41
Arm repair chest, model of 1910	46
Bandoleer	53
Bayonet, model of 1905:	
Component parts	6
Description	21
Repair, spare parts for	44
Bayonet scabbard, model of:	
1905	23
1910	23
Clip	53
Dimensions, principal, of rifle	74
Exterior ballistics:	
Accuracy	60
Corrections corresponding to one point of the deflection scale and to a change in elevation of 25 yards (table)	71
Dangerous spaces	69
Drift (table)	70
Horizontal deviation	70
Longitudinal wind components	72–73
Maximum range	60
Ordinates of trajectory above line of sight	66–68
Penetration	61
Point blank danger space	61
Table of fire	62–65
Windage necessary to correct for a 10-mile-an-hour wind, drift not considered (table)	71
Miscellaneous data	75

Rifle·	Page.
Assembled parts and their operations	27
Assembling after dismounting	36
Bolt mechanism—	
Assembling	33
Dismounting	32
Operation	27
Cleaning	36
Component parts	5
Description	7
Dismounting and assembling by soldier	31
Dismounting, complete	35
Injuries which do not render parts unserviceable	48
Magazine mechanism—	
Dismounting	34
Operation	30
Nomenclature	7
Packing	41
Precautions	31
Pressure	60
Rapidity of fire	60
Recoil	60
Remarks	49
Repair—	
Parts most liable to require	48
Spare parts for	44
Replacing broken parts	48
Using, when certain parts of bolt and magazine mechanism are wanting	49
Tool roll	51
Weights, principal, of rifle	74
Working down bolts	42