

Telescope / Auto-Ranging

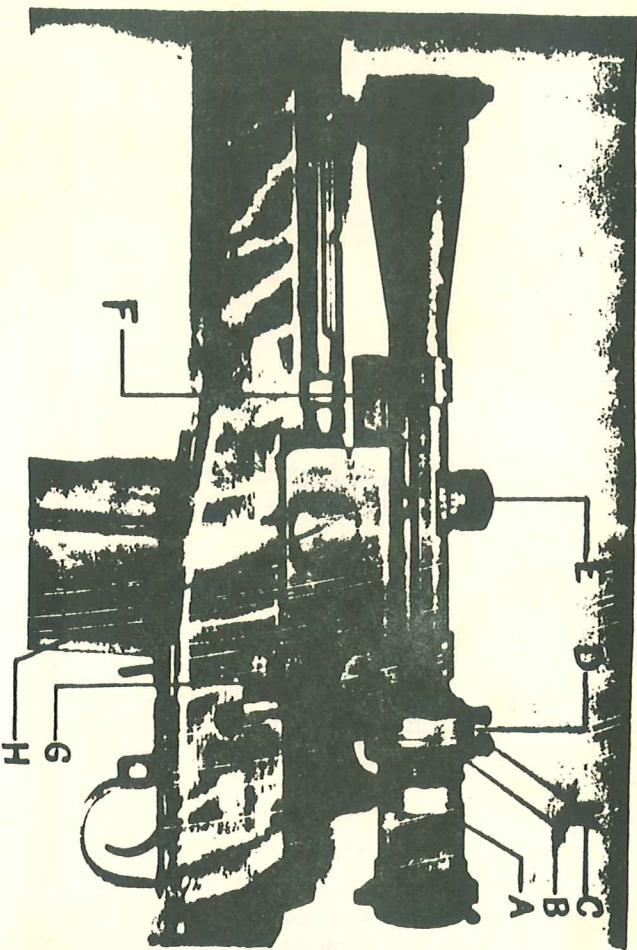


A R T II

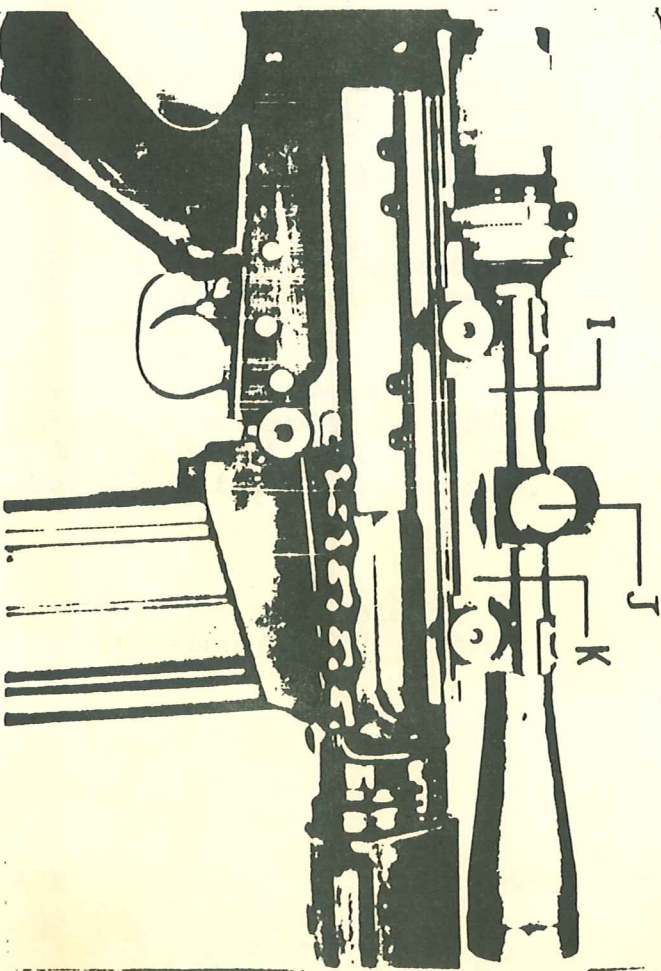
Operation Manual

U.S. M-14 ART II

Quick Detachable ART II



- A - Eyepiece
- B - Power Ring
- C - Locking Thumbscrew
- D - Range Ring
- E - Elevation Adjustment



- F - U.S. M-14 Mount Cradle
- G - Rear Thumbscrew
- H - Front Thumbscrew
- I - Quick Detachable Mount Cradle
- J - Windage Adjustment
- K - Q.D. Thumbnuts and Clamping Rail

The ART II is a 3 X 9 variable power scope that compensates for bullet drop and allows the shooter to aim "dead-on" at his target instead of allowing for bullet drop by "holding-over". Carefully crafted of the finest materials with hand assembly, the ART II is expressly designed for accurate long range shooting, and will withstand the rigors of hard and constant use in the field.

Brief History of ART Scopes

As has been the case with many technological breakthroughs, the Adjustable Ranging Telescope was born out of necessity in the early years of the Viet Nam War.

American servicemen were being killed by enemy snipers and as has so often been the case in the past, the U.S. Army was ill equipped to deal adequately with the problem. The solution was to place trained snipers in service as soon as possible. Sniper training at that time was a long term process that required not only the proper equipment but long hours on the range teaching recruits to estimate distance and to determine the proper amount of "hold-over".

A significant event that would markedly affect the training of snipers as well as their ability to make 1st round hits was the entrance into the U.S. Army by then 2d Lt. James M. Leatherwood. 2d Lt. Leatherwood brought with him a recently patented new principle for a ranging scope that would raise and lower the rear of the scope like an open sight.

Moving rapidly, the U.S. Army soon had working models in the hands of Army snipers. The effects of the new scope were dramatic. It was now possible to rapidly train snipers that were effective at all ranges out to 900 meters without having to devote precious time to instruction on range estimation and bullet drop.

Soon American snipers were dominating the field in Viet Nam and the ART scope was on its way to dominating the world of rifle scopes where long range shooting was a requirement.

Over the years, the ART scope has been steadily improved under the discerning control of the original inventor, James Leatherwood. An unrelenting insistence on durability and quality by Leatherwood resulted in the acceptance of the ART II scope as a standard issue item by the U.S. Army.

The ART is produced under one or more of the following patents. U.S. 3,340,614; 3,431,652; 3,492,733; Canadian 914,957. Other foreign and U.S. patents applied for.

I. Basic Description

- A. **Eye-piece:** The eye-piece is immediately to the rear of the scope and is looked into by the shooter. The shooter may turn the eye-piece right or left, thus changing the scope's focus to suit his individual eyesight.
- B. **Power-Ring:** The power ring is located immediately in front of the eye-piece and has a series of numbers from 3 to 9 stamped on it. Turning this ring to left (counter-clockwise) will increase the magnification of the scope and the numbers on the back of the ring will indicate the power the scope is set on.
- C. **Range-Ring:** The range ring is located in front of the power ring. The range ring is a circular cam that will raise or lower the rear of the scope as the ring is turned. Turning the ring to the left (counter-clockwise) will increase the range setting of the scope and turning it to the right will decrease the range. A series of numbers on the top of the ring is used to denote the range the scope is set on.
- D. **Locking-Thumbscrew:** The locking thumbscrew is located on the power ring. It controls the movement of a sliding pointed key that locks the power and range rings together at the position the shooter desires.
- E. **Elevation and Windage Adjustment:** The elevation and windage adjustments are located in front of the range ring near the center of the scope. The adjustment dials are large and are designed to be turned either by the fingers or with the rim of a cartridge. Each dial is covered by a large, easily removed, knurled turret cap that seals out moisture and dirt. Each graduation on the dial that encircles the elevation and windage adjustments is equal to $\frac{1}{2}$ minute of angle ($\frac{1}{2}''$).
- F. **Mount Cradle:** The mount cradle holds the scope securely in position and allows the scope to move up and down in the rear during the ranging process. NOTE: Each ART II is carefully placed in its cradle and secured. It should NOT BE TAMPERED WITH.

II. Mounting the ART II

Installation on Rifle: The scope must be securely attached to the rifle to assure proper function of zero. As the scope is available in two forms, Quick-Detachable (Q.D.) and U.S. M-14, each will be discussed in the following:

A. Quick-Detachable (Q.D.)

The Q.D. mount is used to secure the scope on the rifle when it is desirable to change quickly from one scope to another (Example: ART II to Night Vision) or to convert to the use of open sights. The ART II with the Q.D. mount is completely reliable and may be placed on and removed from the rifle as often as desired with no change of zero. The Q.D. mount clamps to a base which must be tightly secured to the rifle. With the base tightly on the rifle, the Q.D. mount is installed on the base in three steps:

1. Loosen the two thumbnuts and clamping rail.
2. Place the Q.D. mount on the base, taking care to seat the crossbolts in the recoil grooves of the base.
3. Tighten the two thumbnuts on the Q.D. mount by hand, thus securely clamping the mount to the base.

B. U.S. M-14 Mount

The U.S. M-14 mount is the same as that being used on ART II scopes sold to the U.S. Army. Two large thumb-screws are used to secure the mount to the rifle. One thumb-screw attaches to the forward left side of the rifle's receiver and the other attaches to a specially altered cartridge clip guide located on the rear of the receiver immediately in front of the open rear sight. The second rear thumb-screw is retained in the mount by an adjustable stub. The adjustable stub may be screwed in or out of the side of the mount and the thumb-screw may be screwed in or out of the adjustable stub. The adjustable stub has a lock-nut secured onto it that is used to lock the adjustable stub in position.

The U.S. M-14 mount is installed on the rifle as follows:

1. Remove the rear thumb-screw and lock spring from the adjustable stub and screw the adjustable stub out half way.
2. Place the scope on the left side of the M-14 receiver and screw the front thumb-screw into the forward receiver hole. Tighten the thumb-screw securely while taking care to seat the male recoil lug on the mount into the female recoil lug located on the receiver.
3. With the front thumb-screw securely tightened, screw the adjustable stub in until it touches the cartridge clip guide lightly. Lock the lock-nut on the adjustable stub down and install the rear thumb-screw and lock spring back into the adjustable stub. Screw the rear thumb-screw into the hole in the clip guide and tighten securely.
4. The scope and mount are now securely mounted on the rifle. They may be removed and replaced by loosening and retightening the two thumb-screws.

NOTE: The adjustable stub serves the dual purpose of attaching the mount to the rifle and of adjusting for windage. On some M-14 rifles the barrels are not straight with the receivers and it is difficult if not impossible to zero in the scope using elevation and windage adjustments. By using the adjustable stub, the mount of the ART II may be corrected to the right or left to compensate for a poorly aligned barrel on the rifle. Screwing the stub farther into the mount will cause the bullets point of impact to shift to the left and screwing the stub out and using the thumbnut to pull the mount closer to the receiver will cause the bullets point of impact to shift to the right. The scope and mount should be placed on the rifle as in the previous directions and zeroed in by using the scopes internal windage and elevation adjustments. Only if the scope will not zero in, should the shooter use the adjustable stub to compensate for the barrel to receiver alignment and then use the internal adjustments to zero the scope.

III. Zeroing the ART II

- A. Basic zero with 300-900 meter range ring:
1. Loosen the locking thumbscrew and retract the sliding key so that the range ring and power ring turn independently.
 2. Set the power ring on the magnification you desire to use.
 3. Set the range ring all the way to the right so that the 100 meter marking is at the top.
 4. The scope is now properly set to be zeroed in at 100 meters by using the internal elevation and windage adjustments.
 5. Refer to section C.
- B. Basic zero with 150-450 yard range ring:
1. Loosen the locking thumbscrew and retract the sliding key so that the range ring and power ring turn independently.
 2. Set the power ring on the desired magnification.
 3. Set the range ring all the way to the right so that the 150 yard marking is at the top.
 4. The scope is now properly set to be zeroed in at 150 yards by using the internal elevation and windage adjustments.
 5. Refer to section C.
- C. Basic Zeroing the ART II with the 300-900 meter range ring or the 150-450 yard range ring.
1. Set up a target at the required range for the type of range ring that is installed on the scope. (100 meters for the 300-900 meter range ring or 150 yards for the 150-450 yard range ring.)
 2. Zero the scope in on the target by using the elevation and windage adjustment dials of the scope.
 3. When the rifle is shooting at the point of aim on the target, the scope is ready for use. The scope will now compensate for bullet drop at all ranges that are within the limitations of the range ring.

IV. ART II Ranging System

The ART II Ranging System is composed of the power ring and the range ring. By use of the locking thumbscrew located on the power ring, the shooter may use the sliding key to cause the two rings to turn simultaneously or to turn independently of each other. When the two rings are locked together with the sliding key inserted into the deep V cut into the range ring so that they must turn together, the scope is in the Auto-Range mode. When the locking thumbscrew is loosened and the sliding key is retracted the two rings will turn independently and the scope is in the Manual mode.

A. Auto-Range

In the Auto-Range mode the scope will automatically compensate for bullet drop within the limitations of the range ring. If a 300 to 900 meter range ring is on the scope, it will range from 300 to 900 meters. If a 150 to 450 yard range ring is on the scope, it will range from 150 to 450 yards. The aiming reticle (crosshair and post) of the scope is used to "range" the scope in on the target.

B. Manual

In the Manual mode the power ring and the range ring turn independently of each other. The scope will not "auto-range" in this condition. The scope must be manually set by the shooter for the desired range. The purpose of the manual mode of operation is to allow the shooter to set the scope on any desired combination of magnification and range. By using the manual mode the shooter can use 9 power to shoot at small

targets at the shorter ranges, or the scope can be placed on a power setting such as 6 power and a range setting such as 300 meters or yards to take advantage of any rapidly diminishing target when there is not time enough to use the "Auto-Range" mode.

V. ART II Reticle

The ART II reticle consists of 3 posts, a crosshair and two small dots on each side of the crosshair. The ART II reticle is used to measure a known target size and thus "range" the rifle in on the target. Two basic target sizes are used to range the scope with. A target size of "one meter" is used with the 300-900 meter range ring. A target size of 18" is used with the 150-450 yard range ring. The two dots, one on each side of the crosshair, are used to aid in hold-off for wind or lead on a moving target. With a 300-900 meter range ring on the scope the dots will subtend 60" at 300 meters. With a 150-450 yard range ring on the scope the dots will subtend 28" at 150 yards.

Ranging procedures to be used with the two different range rings are as follows:

A. 300-900 Meter Range Ring

When shooting the ART II with a 300-900 meter range ring installed, the shooter uses a target that is one meter in height or a portion of a target that is equal to 1 meter in height. He uses this known target size to range the scope in on the target by doing the following:

1. Look through the scope at the 1 meter target and place the target near the end of one of the horizontal posts of the reticle.
2. Increase or decrease the power of magnification of the scope until the 1 meter target is the same size as the end of the post.
3. Place the center crosshair of the reticle on the target and fire. The scope has "ranged" in on the target and there is no need to "hold-over" for bullet drop.

B. 150-450 Yard Range Ring

When shooting the ART II with a 150-450 yard range ring installed, the shooter uses a target that is 18" in height, or a portion of a target that is equal to 18" in height. He uses this known target size to "range" the scope in on the target by doing the following:

1. Look through the scope at the 18" target and place the 18" target near the end of one of the horizontal posts of the reticle.
2. Increase or decrease the power of magnification until the 18" target is the same size as the end of the post.
3. Place the center crosshair of the reticle on the target and fire. The scope has "ranged" in on the target and there is no need to "hold-over" for bullet drop.

VI. Precision Zero

Once the shooter is confident that he understands the use of the reticle of the ART II, he should do the following to realize the full potential of the scope:

A. 300 to 900 Meter Range Ring

1. Set the scope in the Auto-Range mode.
2. Set up a one meter target at any distance between 300 and 600 meters.
3. Range the scope in on the one meter target and fire at least a three (3) shot group.

4. If corrections are required, adjust the scope with the internal elevation and windage adjustments until the rifle is shooting to the point of aim on the target.
- B. 150 to 450 Yard Range Ring
1. Set the scope in the Auto-Range mode.
 2. Set up an 18" target and fire at least a three (3) shot group.
 3. If corrections are required, adjust the scope with the internal elevation and windage adjustments until the rifle is shooting to the point of aim on the target.

By performing the above procedures, the shooter will "fine-tune" his rifle over the longer ranges. It is also recommended that the shooter use these procedures to check his rifle when he is operating in an area that varies significantly in temperature or altitude from the one where he originally zeroed the scope in.

VII. Changing Range Rings

To obtain the full potential of the ART II, the shooter should use the proper range ring for the particular cartridge that he is shooting. To change the range ring the following procedure is used:

- A. Set the scope on 3 power and engage the sliding key in the deep V of the range ring and tighten the locking thumbscrew down.
- B. Loosen the small set screw located on the left side of the power ring with an allen wrench. Turn the screw out several turns or approximately $1/8$ ". (NOTE: It is not necessary nor desirable to screw the small set screw completely out of the power ring.)
- C. Turn the power ring to the left until it stops. Using the required pressure, turn the ring approximately $1/4$ " further until you "feel" it slip off the retaining stud and stop.
- D. Pull the power ring to the rear and remove it from the scope.
- E. Turn the range ring to the right to approximately the 350 meter or 275 yard position (depending on the range ring being removed) and pull the ring to the rear over the retaining stud. (NOTE: There is a slot cut into the range ring to allow it to pass over the retaining stud.)
- F. Slide the replacement range ring onto the scope, taking care to position the slot cut in the range ring so that it will allow the ring to pass over the retaining stud. (NOTE: It will be necessary to raise the scope slightly in the rear so that the range ring will go all the way forward.)
- G. Loosen the locking thumbscrew on the power ring and pull the sliding key to the rear.
- H. Place the power ring back on the scope by aligning the slot in it with the retaining stud and pushing it forward until it fits snugly against the range ring.
- I. Turn the power ring to the right until you "feel" it stop. Using the required pressure turn the ring approximately $1/4$ " further until it once again stops.
- J. Tighten the set screw down to once again lock the power ring onto the retaining stud.
- K. Turn the range ring back and forth once or twice to determine proper installation.

L. When the rings are properly installed the range ring will turn freely and the 3 power position on the power ring will once again be at the top when the power ring is turned completely to the right.

VIII. RANGE RING CHART

The following are the cartridges for which range/rings are available for the ART II.

<u>RANGE RING NO.</u>	<u>CARTRIDGE</u>	<u>WT. GRS.</u>	<u>BULLET TYPE</u>
101	.223 Remington	55	FMC
	.243 Winchester	80	PSP
	.264 Winchester Mag.	140	PSPCL
	7 MM Wby. Mag.	154	PT-EX
	.300 Wby. Mag.	180	PT-EX
102	.243 Winchester	100	PSPCL
	7.62 NM	173	FMC
103	.264 Winchester Mag.	100	PSPCL
104	.270 Winchester	150	SPCL
105	7 MM Remington Mag.	150	PSPCL
106	6 MM Remington	100	PSPCL
	7 MM Remington Mag.	175	PSPCL
	.270 Winchester	130	PSPCL
	.300 Winchester Mag.	180	PSPCL
107	6 MM Remington	80	HPPL
	22-250 Remington	55	PSP
	7 MM Wby. Mag.	139	PT-EX
108	.284 Winchester	125	PP-SP
109	30-06 Springfield	150	PSPCL
110	30-06 Springfield	180	PSPCL
111	.300 Winchester Mag.	150	PSPCL
112	.300 Wby. Mag.	150	PT-EX
113	.308 Winchester	150	PSPCL
114	.308 Winchester	180	PSPCL
115	.222 Remington	50	HPPL
116	.280 Remington	150	PSPCL
117	.223 Special Police	55	FMC
118	300-900 Meter .308	173	FMC

BULLET TYPE CODE

FMC - Full Metal Case

PSP - Pointed Soft Point

PT-EX - Pointed Expanding

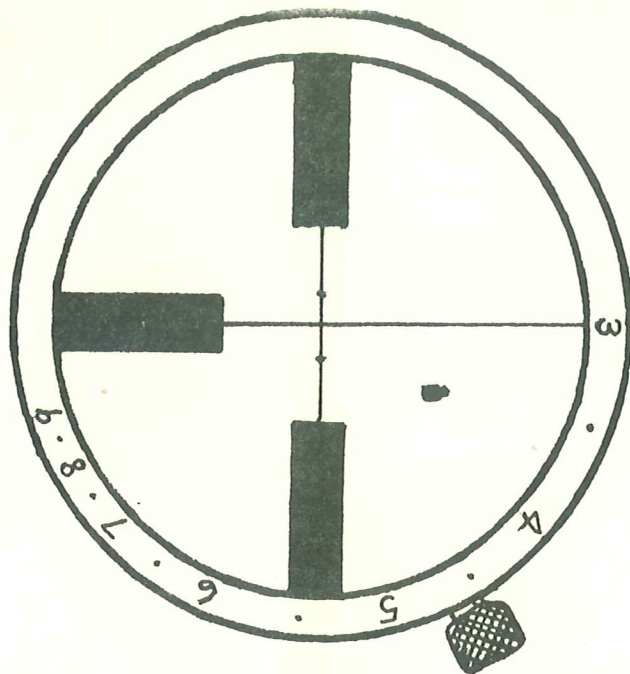
PSPCL - Pointed Soft Point Core Lokt

HPPL - Hollow Point Power Lokt

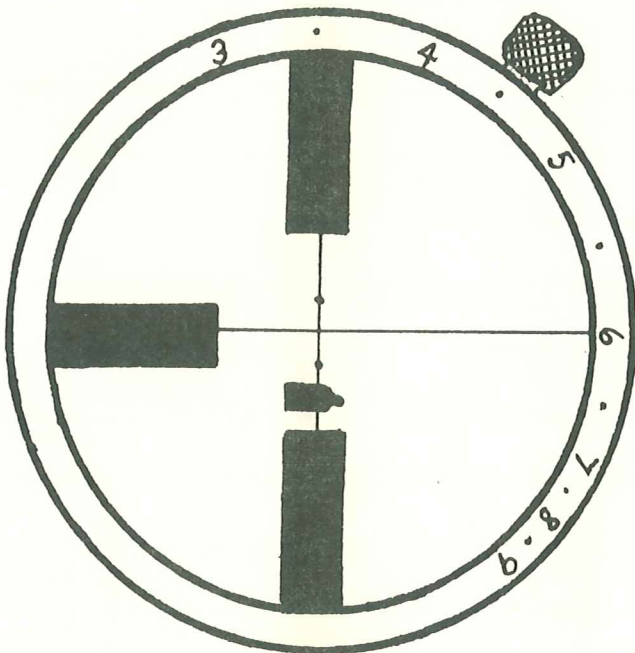
PP-SP - Power Point-Soft Point

RANGING THE ART II

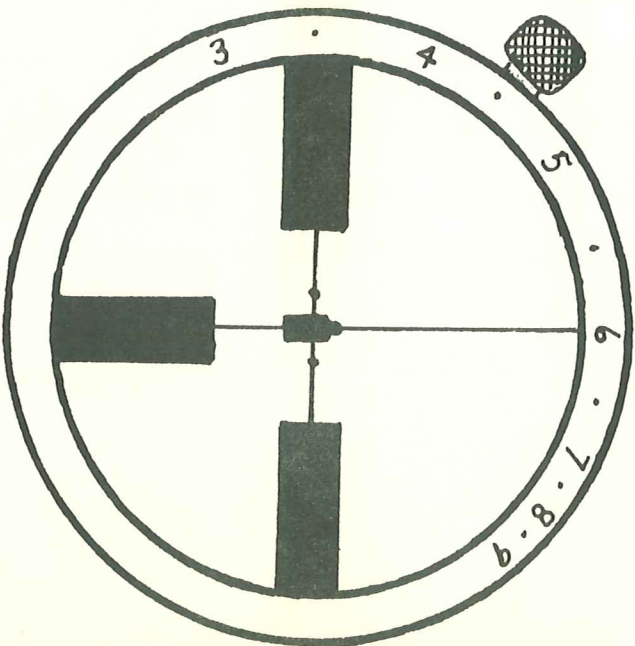
Observe target in scope



Increase power of magnification until target is same height as end of post



Place crosshair on target and fire "No Hold-over"



NOTE: With the 300-900 meter range ring the target must be one (1) meter in height. With the 150-450 yard range ring the target must be 18" (inches) in height.

The ART II is the ultimate scope to use for all shooting situations that require a telescopic sight. In the Auto-Range mode the shooter can fire accurately at distant targets over terrains such as canyons, rivers, lakes or deserts that defy accurate range estimations. In the Manual-Mode the shooter may select the combination of power and range setting that are appropriate to his individual requirements. In heavily covered areas the shooter may desire to select a setting of 3 power and 150-200 yards range. In more open plains country a setting of 6 power and 300-400 yards may be the most desirable setting to take rapid advantage of any fleeting opportunity.

The ART II is versatile. It has been designed by shooters, made by craftsmen, and is in use throughout the world by riflemen.

NOTES:

