

Rifles of Delicate Parts Being Used by Our Boys

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Rifles were not put to any serious use for military operations until the end of the sixteenth century, although their invention dates back nearly one hundred years previous, when they were used for sporting purposes. The advantages of the weapon in point of accuracy and range were well known, but for some reason they were not regarded as of much value by military men until 1680, when the French cavalry were equipped with them. Early in the seventeenth century they were used by certain regiments of the Danish and Bavarian troops. The difficulty of forcing the tight fitting bullet down into the barrel against the grooves so retarded the loading operation that rapid fire was out of the question, and the old smooth bore musket, whose bullet dropped into place easily was the favorite for the service.

Used in American Revolution

The final triumph of the rifle came in the eighteenth century, when the hunter found one type which was especially accurate in its range. During the Revolutionary war it was used with such success that Napoleon armed some of his troops with it, but after a time he gave it up as he considered its firing too slow and declared that it was only fit for sport. After the war of 1812 with the United States the British authorities formed a rifle brigade and armed it with a kind of rifle carrying a spherical bullet, which had to be driven in with a wooden mallet. In this day of rapid fire guns one can scarcely imagine a soldier stopping after every shot to hammer in the bullet and carrying a mallet for this purpose, yet certain troops of the British army used this type for many years. In 1836 the Brunswick rifle, a percussion rifle with a bore over twice as large as the present weapon, was put into use, and for a time efforts were made to overcome the difficulty in loading. Finally the Minie ball, such a favorite during our Civil war, came into existence, being introduced into the British army in 1851. But this was not satisfactory and the inventors kept up their work until the

Enfield rifle of England and the Springfield and Winchester rifles of the United States came into use.

United States Model 1917

From all of these was evolved the famous "United States rifle model 1917," which is now being used by our boys over there and which is being turned out by the thousands in this country today. It is a modified Enfield, a British weapon altered to fit American made 30 calibre cartridges. Since the United States entered in the war more than two and one-half millions of rifles have been turned out from our factories. Not all of these were for us as some were made for our allies, but all for the same purpose—to kill the Huns.

During the early part of the war when England was in as much of a state of unpreparedness as we were on April 6, 1917, several British agents were sent to this country to purchase munitions. They brought with them a single Enfield rifle—a weapon known at that time as an emergency rifle. About 1,200 of these had been hurriedly made in England and the agents were anxious to have a large number of them made in this country. England was hard pressed at that time and the agents were willing to pay big prices to anybody who would take contracts. Many manufacturers who were engaged in making shot guns and sporting rifles enlarged their factories and took the contracts at once. Then the military men of our country began to quietly look into the qualities of the rifle and it was finally decided upon for our army. At present more than 5,000 rifles, the best ever carried by a soldier, are being turned out each day by one plant alone to say nothing of several others who are vying with this factory in the work.

The rifle is a delicate machine and as complex as a tiny watch, and while much of it is turned out by machinery its making requires hundreds of skilled laborers.

Making The Rifle

Rifles are made of the highest grade of nickel, steel and walnut, and like the hogs that go into the big meat packing places in Chicago at one end of the plant and come out as sausages at the other end, so this steel, nickel and walnut go through the big buildings and are turned out at the other end as rifles. The present war has been so overpowering in the slaughter of men, the destruction of property, the number of weapons used, the manner in which they are rushed to the front and the colossal cost, that the average person gives no thought to the extraordinary work required in making each weapon. From beginning to end rifle making seems to be one long series of measuring, testing and gauging.

What is known as the rifle "body" is made of steel and comes to the factory in bars and rods. The principal part of the rifle is the body—the barrel and the receiver—the mechanism which receives the cartridge and thrusts it into the barrel for firing. Uncle Sam's official description of the manufacture of this arm is perhaps the most lucid to a layman. "The body" component begins with a rough forging of the steel which comes to the machinists to be worked into shape. Something like 225 to 230 different operations are necessary to perfect it and about 775 gauges to keep its dimensions within the standard limits as the work goes on. A barrel at the beginning is a piece of steel about nine inches long and one and three-quarter inches in diameter. This is heated to a high temperature and run through a circuth forge, which squeezes it out to a length of thirty inches. The heated metal is then straightened and cooled before it goes to the tools that machine out the bore. The receiver is a similar piece of metal, square instead of round and goes through a number of operations and measurements, as in the case of the barrel. One machine after another is used, the first one makes a long cut through the top of the steel while another smooths off each side. Various gaugings follow for the parts must be accurate to the one thousandth part of an inch.

Must Be Perfect

After this part has been found to be perfect, other cuts are taken, holes are bored, grooves made and screw threads turned out by machinery.

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Each one is so perfect that there must not be a hair breadth difference from the pattern of the rifle. They must also be a minute given distance from the other threads and holes. One of the difficulties of rifle making lies in the fact that if one man makes a mistake all the work that has gone before is useless and the rifle body ruined. In manufacturing a barrel and receiver alone even the most tiny hole is measured again and again, its diameter its circumference and its relations to the other cuts and holes. The limits of accuracy seem to the laymen as infinitesimal.

The tools used are cleverly contrived instruments made so that the part to be measured can be slipped into them and a lever pulled or a screw turned and the proper dimension shown on the machine.

Millions of Measurements

It has been estimated that in making 4,000 rifles alone, nearly three million measurements must be made

in the making of the barrels and receivers, to say nothing of the work of the men who are skilled in assembling the weapons. No machine has yet been invented to straighten barrels, this being done by hand power alone.

The central gauge room with its curious looking machinery is most interesting to the visitor who at first

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