



THE BREECH-LOADING RIFLE—OPEN AND SHUT.

What has been said of the processes in the manufacture of the musket applies directly to the production of the other arms at present made at Norwich, and particularly the beautiful new breech-loading rifles and carbines, excepting that portions of the machinery employed vary in accordance with the variations in the size and form of the arms.

The breech-loading rifle is a new invention of Messrs. Armstrong and Taylor of Augusta, Kentucky, and is made in this country only at the Norwich Works. It is adapted to the use of the metallic cartridge, and can be applied with equal ease to the rifle, the carbine, the fowling-piece, or the pistol. The breech is opened by pressing the thumb upon a spring on the small of the stock. This spring half cocks the piece, and at the same time raises a latch and

permits the barrel to be turned over to the right, thus exposing the chamber into which the cartridge is inserted. At the edge of this chamber, or portion of the barrel, a lip or segment of the barrel is arranged to work outwardly on a worm screw. On this device rests the lip of the cartridge, and after discharging the piece, and detaching the barrel to reload, a further turn moves the segment and at the same time carries out the shell of the cartridge. This part of the gun is extremely simple and interesting. It is so fashioned as to be secure against all liability to get out of order—a fault but too common to this kind of arm. The piece cleans itself at every discharge, and may be fired a thousand times without fouling, the only debris of the powder being a slight deposit of white dust in the grooves of the rifle. It has been subjected to the severest tests, and its performance has always been most admirable. The rifle of this pattern weighs when completed less than seven pounds, and the carbine about six pounds.

Before closing our description of the processes in the manufacture of the musket or rifle, we will refer to another of the ills which the iron of the armorer is heir to in the little flaw known as the cinder-hole. This is a minute cavity left in the iron when it is prepared, and is considered to be the result of some slight development of gas, forming a bubble in the substance of the metal. When the cinder-hole appears near the inner or bore surface, and the iron is still sufficiently thick to permit it to be done, it may be driven in by a blow of the hammer, and then is bored or cut away in the after-operations. This defect was not, in former years, deemed to be of very great consequence, but it has been found that these holes or air-bubbles retain the moisture and other results of combustion, as the piece is discharged, and afterward, through corrosion, increase in size so as ultimately to prove of fatal injury to the barrel. Therefore, in the present high condition of the art, and the greater excellence demanded, the cinder-hole, when it can not be removed, is regarded as cause enough for the rejection of the part in which it may be found.

The absolute necessity of all this nice watchfulness and this rigid requirement in the quality and temper of the iron employed in making arms, and also in the perfect use, in all respects, of perfect material, is sufficiently obvious in view of the very grave service which they may be required to perform.

From the lack of such care it has often happened to the poor soldier in the field that his very defense has been his direct danger, and that his weapon, when used, has done more damage to himself than to his enemy. Many of the arms served out at this day to the troops of Continental Europe have no value except as scarecrows, and are far more likely to do execution at the butt than at the muzzle. It is a pity that there must be added to this the fact that but too many of those in the ranks of our own armies are no better provided, despite the great resources of the