THE PRUSSIAN NEEDLE GUN AND THE FRENCH CHASSEPOT NEEDLE GUN.

Some think they see in the war that has broken out in Europe a theological significance. Others look upon it as purely an anti-Napoleonic movement, while others regard it merely as an effort upon the part of France to recover the Rhenish provinces. Doubtless the war partakes of all these characteristics more or less, but in our view the political necessities of the Napoleonic dynasty at the present moment, are the chief cause of its initiation.

He would be indeed a bold prophet who would venture to predict its duration or final result. Should the conflict be confined entirely to Prussia and France, the respective forces would appear to be nearly equal. The greater number of soldiers which Prussia can throw into the field, is counterbalanced by the power of the French navy, which numbers 402 vessels of all descrip ions, including 55 iron-clads. The whole number carry 4,680 guns.

Both sides are provided with modern field artillery and with powerful batteries of siege guns. The Prussians have Krupp's breech-loading steel rifles, the merits of which are considered questionable by some, but which it is thought by many will prove very effective when properly worked. The amount of breech-loading artillery possessed by the French seems to have been purposely concealed by that government. The *Mitrailleuse*, to perfect which large sums are reported to have been expended, has yet to prove its superiority to the Gatling gun, which has also been adopted by the French Government. It is also said that the Gatling guns have been sent to Prussia. Our readers will find an illustrated description of this gun on page 363, Vol. XXI., of the SCIENTIFIC AMERICAN. But the two weapons which will do most in deciding the result are the Prussian needle gun and the chassepot needle gun. We have before published illustrations and descriptions of these weapons, but as the subject has acquired renewed interest, we again return to it.

The construction of the Prussian needle gun, which proved so destructive during the war of 1866, is shown in Figs. 1, 2, and 3.

Fig. 1 represents the breech piece, with its parts partly in section, contracted longitudinally. In fact this breech-piece is eleven inches long. The case, A, is screwed to the breech of the barrel, which at this point is bored out for a cartridge chamber, to the depth of the lands or grooves in the barrel proper. Inside this case is a cylindrical chamber, B, furnished with a handle and knob, C, which can be moved along a longitudinal slot in the case, having a transverse slot inclining toward the forward or muzzle end. This chamber is convexed or bored at the end, and fits over the conical end of the barrel at D. A sharp blow of the hand on the knob forces its shank into the spirally-transverse slot, and effectually closes the joint at D. Inside the chamber is a cylinder, E, containing the needle bolt, F, the spiral spring, G, and the needle, H. At H is also a plug or guide, screwed to the inside of the chamber, B. On the apex of this the cartridge rests. A spring, I, with its end catch serves to withdraw the cylinder, E, with the bolt, F. The trigger, J, is a bell-crank lever, which depresses the spring, K, and allows the cylinder and contents to be drawn to the rear. L is the powder, M the percussion wafer, N the *sabot*, and O the bullet—all enveloped in paper.

The operation of this mechanism is easily understood. The spring, I, being pressed, unlocks from the case, B, and allows the sliding back of the cylinder, E, so that the rear projection of the bolt, F, takes the spring, K, and the needle is withdrawn into its guide or sheath, H. The chamber, B, is then unlocked by the knob, C, and slid back so that the front projection of F catches the spring, K, thus compressing the spiral, G. The rear of the barrel is thus opened, and the cartridge can be introduced.

The chamber is then moved forward and locked against the barrel, and the spring, I, is pressed down and the needle bolt moved forward, so that the rear projection rests against the spring, K, and the needle rests against the rear of the cartridge, and the piece is ready for firing. The front of the needle bolt is recessed, and receives a leather washer, designed to prevent the escape of the products of the gas combustion to the cylinder, B—an office it performs but inefficiently.

We have expressed the opinion that this gun, although undoubtedly superior to any muzzle-loading gun in destructive efficiency, is far inferior to many American breech-loaders.

The following quotation from the letter of an able correspondent upon the subject sets forth its defects in a strong light:

"The needle gun is a clumsy, unsightly, heavy, and expensive gun compared to many American breech-loaders. It is complicated in its parts, and delicate in its construction. The breech piece, which contains the breech-loading mechanism, is enormously long, extending not less than eleven inches to the rear of the cartridge chamber. The gas check performs its functions badly, as there is so much escape of gas that the gun cannot be fired one hundred rounds without being cleaned. There is also considerable escape of gas into the mechanism through the needle-hole in the face of the breech-closer. This escape of gas soon fills the chamber in the cylindrical breech-closer, which contains the needle pin and spiral spring, with a residuum of burned powder, and seriously impedes their action.

"When the cylindrical breech-closer is shoved forward, the trigger, having taken hold of the needle pin from below, retains it to the rear, and thus compresses the spiral spring, so that the simple act of closing the breech, cocks the piece, and it is only necessary to pull the trigger to fire it. This arrangement is a convenient one for the soldier, and facilitates the firing but it is an objectionable feature in a military arm, because when loaded it must necessarily remain at full cock. It is true there is a means provided for locking the needle pin in this position to prevent accident, but if the soldier should forget or neglect to avail himself of it, then serious accident is liable to take place at any time.

"The ammunition for the needle gun is complicated, expensive, and difficult to make up, considerable special machinery being required for that purpose. The needle gun cannot be fired more than half as many rounds per minute as most of the American metallic-cartridge guns."

Improvements have been made upon this arm which somewhat lessens the force of the above objections, but it is still undoubtedly inferior to some other breech-loaders. The general principle of its construction remains essentially that shown in the engraving.

Fig. 1

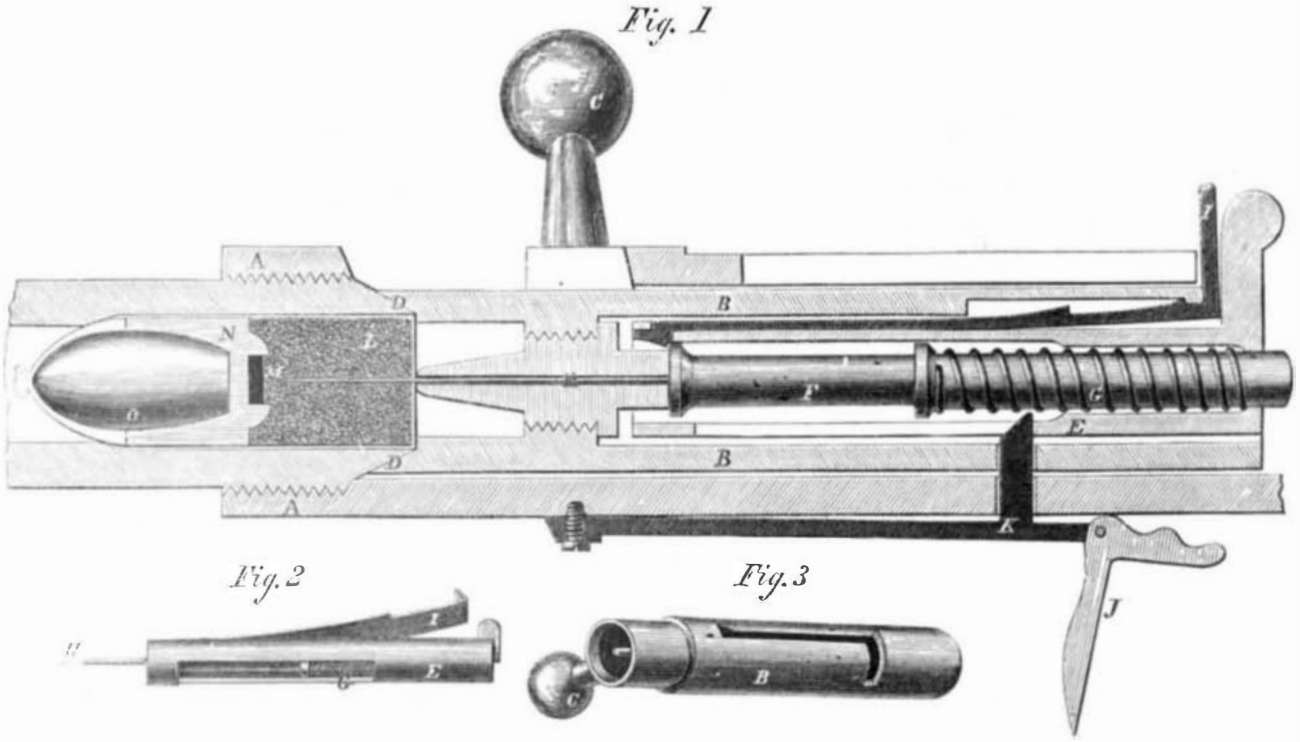
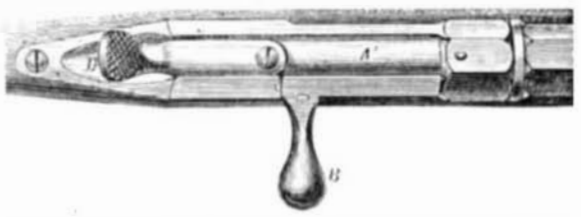


Fig. 2

Fig. 3

THE PRUSSIAN NEEDLE GUN.

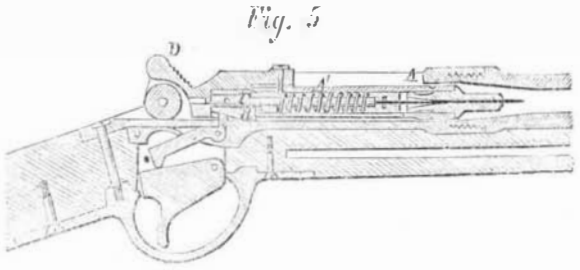
Fig. 4



The chassepot needle gun is considered by some to be an advance upon the Prussian arm. Its construction is shown in Figs. 4 and 5.

An opening on the right hand of the chamber, A, permits the insertion of the cartridge. This chamber is filled by the movable cylinder, A′, which may be moved back or forward by means of the handle and knob, B. The cylinder, A′, surrounds the shaft, C, and can be revolved around the same. It contains the spring by which the needle is propelled. The rear end of the shaft, C, is made in the shape of a handle, D. The spring is compressed when the handle, D, is drawn back. The shoulder, *a*, on the shaft, C′, comes in contact with the cylinder, A′, when the arm is at rest. When loaded and ready for firing, the two parts are drawn asunder. The shaft, C, also serves to protect the needle which is surrounded by the same and is forced out of the front end of the shaft as soon as the trigger is pulled.

Fig. 5



After the cartridge has been inserted, the knob, B, is pressed forward, and is then laid over to the right hand side, a shown in Fig. 4. The aperture, A, is now closed. By the first of these two movements the cylinder, A′, is moved forward, thereby forcing the cartridge into the breech; the second movement secures the cylinder, so that it cannot be thrown back by the force of the explosion. The pulling the trigger releases the spiral spring, which then forces the needle through the percussion wafer. It is claimed that this gun cannot be clogged up as easily as the Prussian needle gun, and is more substantially built. But it is constructed on the same principle in almost every other respect.

It will be seen that these arms must be nearly equal in destructive power, and that when opposed to each other terrible carnage must inevitably result. That this carnage can now be averted by the intervention of other powers, seems hopeless, and it is probable that some of the bloodiest battles ever recorded will sadden the annals of the year 1870.

Railway Torpedo.

This useful little device is often of great value in railway operation. It is a small circular tin can filled with detonating powder, and is fastened to the rail by tin straps bent round the rail.

The Philadelphia and Reading Railroad Company use on an average 35,000 torpedoes annually on their numerous roads. These explosives are called "fog signals," and are used in heavy weather, when the signal lights on the towers cannot be seen from the engine. They are intended to prevent accidents, and have done good service in that respect since their introduction. To make them thoroughly effective three are placed on the track a short distance apart, so that if one should fail to make a report, two would remain to perform that service. The explosion of a torpedo under the wheels of an engine is a warning of impending danger, and the engineer always stops the train in obedience to it.

Coal Dust.

Although many attempts to consolidate coal dust so as to render it economical as fuel have been made, none have, we believe, been able to so utilize it except where it is already transported to trade centers. It would seem, however, that there have been bidders for the great dust heaps in the Pennsylvania coal regions. The New York *Times* in a recent article says the deposits of coal dust in these regions have grown into immense mountains—a burden to the proprietors, and a snare for unwary speculation. One of these, of unusually enticing bulk, has been sold, it is said, over and over again, to ingenious capitalists, chiefly from the Eastern states, and of the *Toodles* pattern. They bought the dust pile because it was cheap for its size, and, from its very apparent worthlessness, suggested immense, if vague, possibilities of honest pennies. But the purchase has always been abandoned in despair by one after another of these misguided financiers. One, indeed, conceived the brilliant idea of sifting his mountain for the solid coal scattered through it, and after procuring an army of carts, and working zealously for a week, really obtained a tun or two of admirable coal. As he ascertained, however, that his sifted coal cost about three times per tun what he would have to pay at the mines, he sagaciously concluded that his undertaking was less profitable than laborious, and so gave it up and fled.

How the Chinese Cook Rice.

The editor of the *American Grocer* states that he has recently paid a visit to the Chinese colony of shoemakers, at North Adams, Mass., and has obtained from them the Chinese method of cooking rice. The process of boiling one pound of rice is as follows: Take a clean stew-pan, with a close-fitting top, then take a clean piece of white muslin, large enough to cover over the top of the pan and hang down inside nearly to, but not in contact with the bottom. Into the sack so formed place the rice, pour over it two cupfuls of water, and put on the top of the stew-pan, so as to hold up the muslin bag inside, and fit tight all round. Place the pan on a slow fire, and the steam generated from the water will cook the rice. Each grain, it is stated, will come out of the boiler as dry and distinct as if just taken from the hull. More water may be poured into the pan if necessary, but only sufficient to keep up the steam till the rice is cooked. The pan must not be heated so hot as to cause the steam to blow off the lid. The Chinese at North Adams, if they look about a little, will find Yankee vessels made of tin containing perforated shelves or diaphragms for cooking rice and other articles by steam, on the same principle as the muslin sack, and much more convenient.

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