

NEW CARTRIDGES AND SHOT.

Mr. S. Franklin Schoonmaker, a theological student in this city, proposes to make cartridges for large guns with two or more chambers, for the purpose of relieving the guns from excessive strain at the instant of discharge. The cartridge is to have its chambers separated by perforated metallic plates to divide the full charge of powder and start the shot under a lower pressure than when the whole charge of powder is packed close together. Perhaps this idea is worthy of further investigation, although the ignition of all the powder, even with such cartridges, must be almost instantaneous.

Mr. I. W. Shaler, of Brooklyn, has left us samples of his sectional conical bullets and new cartridges—which do not require to be torn in opening. The bullet is divided into three sections, each a hollow cone, the one fitting into the other, so as to form one long conical bullet in the cartridge. The object of such bullets is to use them in the musket rifle and obtain the accuracy and range of the rifle, with one of the cones, while the other two separate and at a certain range "kill three at a blow." Experiments have been made with such bullets at Washington, and an order has been given for a large quantity for the army. For firing upon close columns they will be very destructive. The cartridge attached to this bullet is opened by drawing a small piece of cord that is twisted into it. It neither requires to be bitten by the teeth, nor torn by a knife, or the sharp edge on the rifle.

Compressed Gunpowder.

The following we extract from "Well's Annual of Scientific Discovery" for 1862, just issued by Gould & Lincoln, Boston, on the subject of compressed gunpowder:—

The idea has been suggested by Prof. R. O. Doremus, the well-known chemist, of New York, that gunpowder for projectile purposes may, in most cases, be used with as great advantage in the form of compressed cylindrical cakes as in grains; and experiments instituted under his auspices by ordnance officers of the U. S. Army, have given most satisfactory results. Most persons would unhesitatingly assert that gunpowder compressed in a hydraulic press, to a consistency so hard as to resist fracture on being struck violently, would burn when ignited in the manner of a fuse or slow match. Such, however, is not the case, as the compressed cake explodes on the application of fire with apparently as great rapidity as loose grains. The idea of using compressed powder, if found practically available, is one of the most useful of recent improvements in military science, inasmuch as it entirely obviates the necessity of a cartridge—either cannon or musket—reduces the bulk of the powder two-thirds or more, and saves the waste consequent on transporting and handling powder in grains.

From the above the reader would suppose that the compressing of gunpowder into solid cakes or cartridges was a new invention, but on referring to the London *Mechanics' Magazine*, page 306, Vol. III., new series, we find the claim of J. H. Brown, patented October 15, 1859, which reads as follows:—

2,357.—J. H. Brown. Improvements in the Preparation of Gunpowder for Loading Ordnance and Firearms. Dated Oct. 15, 1859.

The patentee claims combining and compressing grains of gunpowder, with an adhesive solution, into solid cakes or charges for loading ordnance and firearms. Patent completed.

On the 21st of May, 1861, Robert Bartholomew, of the U. S. Army, obtained a patent for compressed cartridges of powder, the latter being composed of nitrate of potassa, 75 parts; charcoal, 12; sulphur, 10; chlorate of potassa, 3. These ingredients (in powder) are incorporated with collodion, &c., and finally coated with collodion.

It would seem, therefore, that whatever merit may be attached to Prof. Doremus's discovery, the idea of compressing gunpowder is not of very recent origin, and if it is of the practical importance which has been claimed for it it is surprising to us that it has not come into more general use.

Petroleum in London.

The Insurance Companies in London, like those in New York, have become alarmed at the large quantity of well oil at present stored in the British metropolis. These companies have laid their grievances before the Mayor, and they assert that this oil is of a most inflammable and dangerous character, being liable to spontaneous combustion. It is said that there are about half a million of gallons of such oils now stored on the wharves in London. As crude petroleum is more dangerous than the refined quantities, and as the cost for carriage to market is just the same for both, it would be well to refine all petroleum in the vicinity of the oil wells.

Mail-clad Vessels and American Guns Discussed in Parliament.

By the latest news from England we learn that on the 2d of April, in the House of Commons, Sir F. Smith called attention to the engagement between the *Monitor* and *Merrimac*, and urged the consideration of future prospects of defensive warfare. He argued in favor of small vessels like the *Monitor* in preference to stationary forts, and advocated the cessation of work on fortifications, and the construction of iron gunboats or batteries instead.

A general debate ensued, most of the speakers opposing outlay on fortifications.

Sir G. C. Lewis and Lord C. Paget, on behalf of the Government, warned the House against hasty action, and the enormous expense this revolution in naval warfare would entail. They questioned whether the *Merrimac* and *Monitor* had thrown any new light on the subject, and thought forts could be made to maintain their superiority. They believed artillery could be made to crush these iron vessels. It would not do to proceed hastily, without further experience, but the government would watch the question carefully.—The subject dropped without action, but Mr. Bernal Osborne gave formal notice of a motion that it is expedient to suspend the construction of forts at Spithead until the value of iron-roofed gunboats for the defence of ports, shall be fully considered, and Lord Bentinck moved an amendment to Mr. Osborne's resolution declaring it inexpedient to proceed with fortifications, to the effect that the government be empowered to apply the money voted for fortifications to the construction of iron sheathed vessels.

The *Morning Post* calls attention to the improvements America is making in ordnance, the weight of the shot thrown by the *Monitor* being nearly double that used on board any of the British ships.

The construction of entire wooden vessels in all the English dock yards has been suspended.

New Mode of Copying Engravings.

The Paris correspondent of the *Photographic News* say:—M. Brettiger suggests a very simple method of reproducing by chemical means an engraving from a steel or copper plate. Dissolve in 1,500 parts of pure water 16 parts of pure, concentrated sulphuric acid, and to 200 parts of the mixture add $\frac{1}{2}$ part of iodide of cadmium. This last mixture is poured into a dish, and the engraving is immersed in it, and left till it has become thoroughly impregnated with the liquid, it is then placed upon folded sheets of white blotting-paper, on a plate of glass, and the excess of moisture removed from the engraving: it is then placed printed sides downward upon a sheet of writing or of positive paper, and placed in a press. An impression is obtained as delicate as that furnished by photographic processes. The iodide of cadmium may be replaced by iodide of potassium. The reproduction is due to the reduction of the iodine by the Frankfort black in the ink of the engraving, and the liberated iodine acts upon the starch with which the paper is sized. The engraving will give a second impression without being returned to the solution. When the engraving has been used several times, it is only necessary to wash it in water to remove the spots that may have formed. Lithographs and ordinary printed matter cannot be reproduced by this process, on account of the nature of the printing ink, but writing ink succeeds very well. Unfortunately, these beautiful impressions become blew all over, and are gradually effaced, even if covered with a coat of varnish.

Our Naval Authorities.

Our respected cotemporary the *Evening Post*, in alluding to the successful raid of the *Merrimac*, at Hampton Roads, characterizes it as "the result of negligence in not having long since taken Norfolk." This desirable object might have been achieved with comparatively little sacrifice of life but for the imbecility of the naval authorities in not earlier advising the construction of iron-clad gun boats. If the Naval Constructor's Bureau had recommended the building of Donald McKay's battery, Norfolk would have been in possession of the government three months ago. Oh for a change in our Naval Department! Let us have live, progressive men to manage it and all will go well. So long as the *Merrimac* is afloat our navy is in disgrace.

Remarkable Boiler Explosions.

We have received a communication from a correspondent, with a diagram of the Maryland Blind Institute, in Baltimore, describing the explosion of a steam boiler, which took place in the bake house of that establishment on the 31st ult. The boiler was an upright, 10 feet long and 4 $\frac{1}{2}$ feet in diameter, and had a conical firebox. The space between the crown sheet and the top of the boiler was between three and four feet. The boiler exploded inward, and the conical firebox was torn crosswise near the top. This boiler rose entire from the boiler room, and took a diagonal direction from the place where it was situated, and was projected to the distance of 100 feet, and to a height of 50 feet above the main building. When it had reached this height (about 150 feet) several witnesses testify that it exploded again, and took a direction parallel with the north wing of the building, and finally fell through the roof end of the wing, breaking a hole about 10 by 20 feet, and lodging on the top floor, in a school containing seventy boys, killing two and wounding seven. Our correspondent states that there was an explosion when the boiler reached 50 feet above the main building, but there was no explosion in the boiler room, he believes. He says the boiler must have been raised from its seat by the action of some other force than the steam, and inquires what was it? He states that a similar and peculiar explosion took place several years ago at Rogers, Ketchum & Grosvenor's locomotive works, Patterson, N. J. A new locomotive had been blocked up on the floor, for the purpose of trying its machinery. The water in the boiler was allowed to get too low when there was a strong fire in the box. The engine jumped entire straight up through the building, and tumbled over on the peak of the roof, with the smoke stack hanging over the gable end.

In our opinion the water in the Baltimore boiler was suffered to fall below the crown sheet of the firebox. The latter became red hot and was fractured, and the steam came in contact with the fire, its great force then acted upon the top end of the boiler, projecting it upward like a rocket. Thesecond explosion of this boiler is not so easily explained.

The projection of exploded steam boilers entire from their fixed positions is not uncommon. A vertical boiler, 21 feet long and 9 feet in diameter, exploded in this manner in the Manchester District, England, in the month of February last. It flew straight up through the roof of the building to a great height, then it was struck with a strong gust of wind and carried a considerable distance out of its former course. Six persons were killed by this accident, and the cause was undoubtedly the same as that which resulted in the explosion at Baltimore.

The Iron-clad Frigate Kensington.

This iron-cased frigate, which is now building at Philadelphia, by Messrs. Cramp & Son, is progressing rapidly. There are nearly five hundred hands engaged upon her, and the first row of plates has been put on. The plates extend beyond the beam for about five feet and form a formidable ram. These plates are each 15 feet long, 28 $\frac{1}{2}$ inches wide and 4 $\frac{1}{2}$ inches thick (we understand). They are made at Pittsburgh, and are tongued and grooved like those of the *Marion*. She will be 3,500 tons burden, and be in all respects, a first class, small, iron-clad frigate. Her sides will be perfectly smooth, and present an angle of 30° to the enemy's shot. It is not expected that she will be ready for launching within two months.

WEIGHT OF CANNON.—A navy 64 pounder weighs 184 times as much as one of its shot. The English wrought-iron 13-inch gun, of Horsfall's, is 170 times heavier than its shot. The Rodman 15-inch gun weighs 150 times more than its shell, and 114 times more than its solid shot. The projectiles fired by the *Monitor* were 11-inch shells, with a small cavity, and very thick walls, weighing 169 lbs., and 93 $\frac{1}{2}$ of them weighed as much as the gun. It is laid down as a general rule that a cannon should be at least 100 times heavier than its shot.

SHEEP IN CALIFORNIA.—A correspondent of the *Pacific Sentinel* estimates the number of sheep in California at 2,000,000, and the average amount of fleece on each at three pounds, giving an annual wool crop of 6,000,000 pounds, with a rapidly increasing tendency.