

**Trial of Armor Plates, Steel Guns, &c., at St. Petersburg.**

On Wednesday, the 17th of October, N. S., further trials took place at St. Petersburg with the experimental 19-inch rifled cast-steel gun. The *London Times* states that this gun is of solid cast-steel, made by Krupp, and throws a 300-pound shell or a 450-pound solid shot. The results of previous experiments with this gun led the Russian Government to order 50 of them, which are now in course of delivery. The principal objects of the experiments on the 7th inst. were to ascertain the best description of shell, and to test the quality of armor plates supplied by Messrs. John Brown & Co., of Sheffield.

First, a series of cast-iron shells, 300 pounds each, were fired at different ranges, and then shells made by Krupp were fired at the 4½ inch armor plates. The first shell, of hard cast-steel, was 22½ inches long (two and a half diameters), with a flat end 4 inches in diameter. Fired with 50 pounds of powder at 700 feet distance, it passed through the plate, oak and teak backing, and broke into many pieces, although filled with sand only. The second and third shells were also of Krupp's steel, the same length, but with 6½ inch ends. These shells pierced plates, wood, &c., and also went to pieces, although only filled with sand. The fourth shell was made by M. Poteff, of puddled steel, on Aboukoff's system, the same dimensions as the second and third, and went through iron, teak, &c., but was only bulged up from 9 inches to 12 inches, and the end flattened; not a single crack being visible in the shell. The fifth shell, the same as the fourth, passed through iron, teak, and the second target, and went at least a mile beyond. The sixth and seventh were from Krupp, and were charged with powder; they were quite flattened, 9 inches in diameter. One exploded in the plate, the other in the wood. The eighth and ninth shells were of cast-iron, and, although they passed through the plates, were of course destroyed. Evening prevented further trials, which will yet be made on the same plate.

The results on the plate were highly satisfactory. In a space of 4 feet 6 inches by 3 feet 6 inches, eight holes were made without any crack of the slightest description; and the marine officers present were highly satisfied, because they are obtaining 4,000 tons of plates from Messrs. John Brown & Co. for their different ships.

Cast-steel guns are decidedly before any yet produced in England of any other metal. The 9-inch gun of Krupp has been fired with 300-pound shells and 50 pounds of powder, about 70 times, without any flaw; and the Russian Government will shortly be in a position to obtain in St. Petersburg a large supply of cast-steel guns, made from Russian iron, by Russians, on Aboukoff's system, which is very nearly the same as Krupp's.—*London Engineer*.

**Grain Produce at Chicago.**

The receipts of flour and grain at Chicago during the past two months have been enormous—amounting to 6,987,491 bushels wheat—showing an increase over the receipts during the same time last year of 1,097,428 bushels. The receipts of corn show a large decrease, the entire receipts for September and October being only 3,917,513 bushels, against 7,630,042 bushels last year. This decrease is the result of the early frost, but does not fairly represent the extent of damage, we think; as the growers have held back their supplies for higher prices, which is usually the case in times of excitement in the market, when prices rapidly advance.

There are no shipments of grain from New York to Europe on war orders, because prices are lower on the other side of the Atlantic than they are here.

**Finances of California.**

California has an area of 188,892 square miles, and in 1860 contained 879,994 inhabitants, showing a density of 2.01 persons to the square mile.

The private wealth in the State in 1862 amounted to \$160,369,072, of which \$80,735,855 represented real estate, and \$72,647,666 personal property. This gives \$422.03 to each inhabitant.

The amount of taxes levied on property in 1862 amounted to \$3,673,129, of which \$1,221,064, was for State purposes (including federal tax), being 77 cents per \$100 valuation, and \$2,453,065 for county

purposes. The State tax averaged \$3.21 to each inhabitant.

The receipts of the State Treasury from all sources in 1862 amounted to \$1,031,529, and the expenditures for the same year to \$1,146,744. The expenditures were equal to \$3.02 to each inhabitant. The debt of the State amounts to \$5,569,284.

**Driving Wheels of Locomotives.**

In an article on the driving wheels of locomotives, the *London Mechanics' Magazine* says:—"Speed really depends on boiler power, and the rapid reciprocation of the pistons is no real evil. Theoretically objectionable, practice proves, in the clearest manner, that working expenses are not increased by it to any appreciable extent. Immense driving wheels no longer enjoy the popularity they once did; and we much doubt that any engines are now being built with them. Indicator diagrams taken from an express engine, with seven feet two inch drivers, at a speed of 63 miles per hour, are almost identical with those taken from a nearly similar engine, with drivers a foot higher, at 60 miles per hour. The indicator is, after all, the real test of the good qualities of a locomotive, as far as the action of steam is concerned; and we regard such a result as pretty conclusive that nothing is to be gained by the use of a wheel much over nine feet in diameter. A rapid reciprocation of the pistons permits the use of a large blast-pipe, as the blast in the chimney is equalized and rendered more effective, while it does not cut up the fire so much as an exhaust at comparatively distant intervals. Regard the matter as we may, we believe that there is no difficulty in proving that the most efficient engines ever built have had driving wheels of moderate diameter; and railway companies will find it good policy to return to their use."

**Patterns by Post.**

Patterns of merchandise may now be transmitted by post between any places in Great Britain, at the following rates of postage, which must in all cases be pre-paid by means of postage stamps, namely: for a packet weighing not more than 4 oz., 3d.; more than 4 oz. but not more than 8 oz., 6d.; more than 8 oz., but not more than 16 oz., 1s.; more than 16 oz., but not more than 24 oz., 1s. 6d. No packet of patterns must exceed 24 oz. in weight; exceeding that weight, it will be treated and charged as a letter. The pattern must not be of intrinsic value. This rule excludes all articles of a saleable nature, and indeed whatever may have a value of its own, apart from its mere use as a pattern; and the quantity of any material, sent ostensibly as a pattern, must not be so great that it can fairly be considered as having, on this ground, an intrinsic value. Samples of seeds, drugs, &c., which cannot be sent in open covers, may be inclosed in bags of linen, or other material, tied at the neck. One rule forbids the transmission, through the post, of any article likely to injure the contents of the mail bags.

**MISCELLANEOUS SUMMARY.**

**SMALL TURBINE WHEELS IN CITIES.**—In Manchester, England, Mr. Schiele is building some turbine water-wheels of only a few inches diameter, which are driven by the water in the pipes that supply the city. These small wheels are employed to drive fans, the bellows of organs, sewing machines, &c., and wherever there is a sufficient pressure of water in any city, they may be thus used with great economy. As convenient small motors, nothing can excel them, as they can be set in motion and stopped as easily as gas can be let on and off in the supply pipes.

The fisheries about Sandusky and the islands are reported as yielding immensely this fall. The run of white fish is large, and the quality excellent. Large quantities of these fish are being packed at Sandusky, to supply the demand from all parts of the country.

A mine of magnetic iron has been opened in Sweden, several feet thick, which causes a deviation of the needle of from ten to fifteen degrees. Natural magnets of 4 cwt., will soon, says a Copenhagen letter, be no rarity in commerce.

The total of natives of European continental states residing in London is 37,955.

**BRITISH ARMY RECRUITS.**—The following is an account of the occupations of British recruits, and the amount of education they received before entering the army. We find that 9,420 were laborers, husbandmen, and servants, 2,783 manufacturing artificers, 4,863 mechanics, 2,051 shopmen and clerks, 108 professional men or students, and 142 boys enlisted as drummers. Ireland furnishes much above the average proportion of laborers; Scotland, of manufacturing artificers and mechanics; and England, of shopmen and clerks. Of every 1,000 English recruits, 247 were unable to read or write, 51 could read only, and 702 could both read and write. Of every 1,000 Scotch recruits, 163 could neither read nor write, 156 could read only, and 681 could both read and write. Of every 1,000 Irish recruits, 321 could neither read nor write, 145 could read only, and 534 could both read and write.

**AN ITALIAN RECIPE FOR MAKING WINE.**—An American having written to a friend in Italy for instructions as to making wine, received the following broken English reply:—

"The way to make wine with grapes is to stomp well them in a tub with a hol and spicket in the botton, and put that juse in a barel where has ben wine or whiekey or liquors of some kind, otherwise the wine will stink of wood. Let them boil for forty days meanwhile making the barel full every day for in the boiling diminish. Shot up it after the forty days, and longer you let him stay older it comes and better it will be."

The word "boil" means in this case, "ferment." The rest is intelligible, and those who follow the receipt faithfully will find it a good one.

**NEW MODE OF PRESERVING PROVISIONS.**—A patent has been applied for by A. H. Remond, of London, for preserving provisions by passing a current of electricity through the cans or cases containing what are called "preserved provisions," after they are sealed up. The electric fluid is made to pass through the case on a fine iron wire; the wire is caused to become red hot by the intensity of the current, and thus the oxygen in the can is said to be consumed, because it will unite with the hot iron wire and form an oxide.

The *Newport (Vt.) News* says one of the most distinguished geologists of New England has just made a very favorable report on the lead mines along the shore of Lake Memphremagog, Vt. The mines are represented as property of great value, and steps will be immediately taken to work them.

**JOKING.**—Never risk a joke, even the least offensive in its nature, with a stranger or a person who is not well bred and possessed of sense to comprehend it. By heeding this advice you will save yourself mortification and pain.

A FLAX COTTON mill is fitted up at East Toledo, Ohio, which is expected to consume 4,900 pounds daily of raw material, and produce 2,000 pounds of cottonized flax. Eastern sateen manufacturers have agreed to take it all.

**SKATING.**—Ice formed in the mill ponds of this village during the night of Thursday, Oct. 29th, two or three inches thick, and our young people had a lively time skating in the early part of the next day.—*Coos (N. H.) Republican*.

In Collinsville, at the Collins company's works, with Edward Lang for helper, L. T. Richardson made from the bar 10,000 bayonet blades in October, and challenges any man to beat it.

The number of fire-arms manufactured at Colt's armory in Hartford, during October, averaged one a minute through ten hours of each day in the week, Sundays excepted.

**Correction**

In setting up the description of an "Improved Quartz Mill," on page 305, current volume, an omission occurred which changed the sense of the text: "a simple wheel, turning on its axle and driven by animal power"—should read: "a simple wheel, traveling around in an annular trough, turning on or driven by its axle by animal power; after many years one more wheel was added—thus making what is known as the Chilean Mill," &c.