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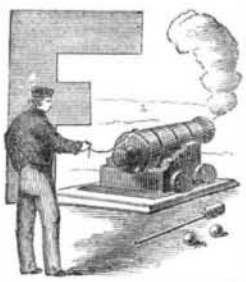
GREAT GUNS.



FROM Europe there come notes of approaching war, and on our side of the water "the front of battle lowers" between the United States and Mexico. As a consequence of "smelling the battle from afar," there is considerable activity among inventors to furnish the most perfect and formidable engines of destruction; their attention has been intensely concentrated on this object, and breech-loading rifled cannon seem to be the objects of their special devotion. There can be no doubt that an army furnished with superior artillery has a vast advantage over another of equal numbers and in all other respects as well equipped. It is no wonder, therefore, that efforts are now making by all fighting countries to invent the best cannon. We have now before us a pamphlet by J. Webster Cochran, of this city, describing an improved cannon and projectiles, which are claimed to be very superior; and experiments have proved them to be of great value and importance. In Europe, the rifled cannon of the Emperor Louis Napoleon, of Sir William Armstrong, and of Mr. Joseph Whitworth are said to possess great range and accuracy, but their durability is held to be very limited; they are liable to burst, owing to the great pressure of the ignited charge in the chamber. The effect of successive discharges upon such guns is like concussions upon a locomotive without springs; such an engine would break down during the first trip. The Cochran (American) gun has a screw breech, and is provided with a plunger behind the charge chamber, and behind this there is a powerful volute spring which acts the part of an elastic cushion. There is also a light charge exploded in the chamber before the main one is ignited, so that the shot is started easily, and, when started, it receives the full force of the expansion. The pressure which the powder exerts when ignited—and before the shot moves—to burst the gun, is thus directed more immediately to propel the shot forward; and very perfect combustion of the powder is also effected, which greatly increases the range.

The Armstrong gun which is now being manufactured by the British government, is a breech-loading rifle of peculiar construction. Instead of being made of cast it is formed of wrought iron, in three separate hollow coils welded upon the top of one another, to constitute the barrel. Its breech end is open and has an inside screw thread cut upon it; behind this is a large hollow screw, through which the shot is introduced into the chamber, and just in front of this is a large vertical wedge or plug which forms the butt of the charge chamber. This wedge is drawn out when the gun is to be loaded; then when the shot is passed through the hollow screw, the butt is forced down behind it, and the screw turned with a lever which wedges the plug close behind the charge. This butt or breech-piece is faced with copper and is very strong. The grooves of this famous gun are angular, 40 in number, and very fine. Their pitch is 10½ feet, consequently the shot makes a revolution in that distance. These guns are fabricated from the finest bars of wrought iron, and are forged upon the same principle as the "stub and twist" barrels of fowling-pieces. Their range and accuracy are great, in comparison with the old smooth bores of cast iron; and 3,000 of them are to be finished this year.

A formidable competitor to the Armstrong gun has lately been tried by its inventor, Mr. Whitworth, the famous tool-maker in Manchester, who was appointed one of the commissioners to the American Crystal Palace Exhibition held in 1853. His cannon are said to surpass all those that have yet been tried in England, either for range, accuracy, or durability. The bore of his guns is hexagonal, with rounded spiral grooves of a very short pitch. The interior of the barrel is composed of rifling surfaces entirely, not a set of spiral grooves and non-effective *lands*, as in common rifles. On the 16th of February, quite a number of experiments were made with three of Whitworth's cannon, at Southport (England), in the presence of many military and naval officers. A 3-pounder, weighing 208 lbs., length 6 feet, bore 1½ inches, and pitch 3 feet 4 inches surpassed any cannon we ever heard of for range. With a charge of 8 ounces of powder, and an elevation of 35°, it carried to a distance of 9,688 yards—about 5½ miles—and it ranged very straight. An 80-pounder, with a 12-pound charge, elevated at 10°, carried 4,730 yards, with a deviation of only 6 yards. The London *Times* and the *Mechanics' Magazine* are in raptures over the performances of the Whitworth cannon. With the 3-pounder, pickets of cavalry may be "picked off" at a distance of six miles as easily as larks at 30 yards. They consider that "Old England" is now safe from the machinations and ambition of the ruler of France. Roast beef and plum pudding are safe; London porter will keep quiet as usual, and Uncle John may sleep secure in his "red nightcap," without dreaming of thunder. The Whitworth cannon is made of homogeneous cast iron. The breech consists of a cap with a double screw, and it is screwed off and on with two turns to load and discharge. No lead band is required on the shot; they are made to fit the grooves without expanding. The 3-pounder has been fired 3,000 times and exhibits no sign of wear; it is, therefore, "a great gun."

When we hear such thundering of cannon coming across the Atlantic, we ask the modest question: "What is *our* government doing to improve our artillery?" Here is Cochran's effective breech-loading rifled gun at our own door; and yet our arsenals and dockyards have only "old fogy" cast iron smooth-bored guns. These were good enough in the days when Santa Anna's wooden leg flourished against us on the field; but they are behind the present age. They should be melted down and converted into homogeneous, native breech-loading riflers, or rifled guns of any sort, rather than be behind the "great guns" of other navies and armies.

PATENT EXTENSIONS—CURIOUS PARAGRAPH—COMMISSIONER THOMAS.

The Morse patent machine, for telegraph operation, will soon come up for an extension of five or seven years. It will meet with strong opposition from several parties. The principal of patent extension is adverse to the policy of the government in that department.

We find the above paragraph among the items of news in a recent Washington letter to one of the daily papers of this city. It is easy enough to understand the first two sentences, but it would puzzle a Philadelphia lawyer to unravel the mystery which envelops the last one. We can only conjecture that the writer means to say that the *principal* of the Patent Office, who is no other than the Hon. Philip F. Thomas, is opposed to the extension of patents. We could not have ciphered out such an inference, even from the above paragraph, but for a statement which has been made in our hearing, to the effect that Mr. Thomas was understood to be constitutionally opposed to the extension of patents, regarding them in the light of oppressive monopolies. We do not believe that this is true, although we have had no opportunity to test the truth or falsity of the matter. He cannot, however, remain long in his present position without settling, in a definite manner, his *constitutional* views on this subject. Probably the most delicate and responsible of all the duties of the Commissioner of Patents is to decide upon the interests of patentees in extension cases; and no man would be fit to hold that office for a single day who carried in his breast a prejudice against their rights and interests, which are too vast and too important to be adjudicated upon, except by one who can bring to their consideration an unbiassed judgment. If there is to be any constitutional prejudice in the matter, it ought to lean rather towards the inventor; for, certainly, his lot is a sufficiently hard one, as a general rule, without encountering at the doors of the Patent Office a spirit of even partial hostility. We do not write thus because we cherish the belief that the rumor concerning Mr. Thomas is well founded. We believe it is not; but his acts will speak his mind better than the mere gossip of newspaper writers.

When Commissioner Mason found the Patent Office little else than "noise and confusion," and exceedingly unpopular with inventors in all parts of the country, he became to them a sort of *pater familias*, and soon restored the office to credit and usefulness. His successors followed in his footsteps, and we trust the lesson will not be unheeded by the new Commissioner, all rumors to the contrary notwithstanding.

AGRICULTURAL SCIENCE—TOP DRESSINGS—BLANCHING VEGETABLES.

Now is the season for the application of "top dressings" for pasture, meadow and other lands. The best substances for this purpose afford matter worthy of attention, and yet it is difficult to give any but general advice, as the nature of the soil must always be taken into consideration in providing suitable fertilizers. Gypsum (common plaster) is very extensively employed for top dressings; but many farmers question its advantages except for clover. Gypsum is composed of about equal parts of lime, water and sulphuric acid. It is a mineral which is found in the tertiary formation above the chalk and it is also an accompanying bed of the new red sandstone which covers the coal measures. On pasture land it produces good effects when applied on the clover as it is springing up in early Spring. Air-slacked lime has been of considerable benefit in some particular situations, when thinly sowed upon pasture lands. It has produced good effects on grass where there has been considerable sorrel and moss, by making fine grass spring up in the place of these. It is very good for coarse, thin pastures, situated on high grounds, but it is best to apply it mixed with half its weight of clay. In western Pennsylvania, Ohio, and all places where bituminous coal is employed for fuel, its soot is excellent for a top dressing for gardens and all lands. It contains some traces of potash ammoniacal salts and pungent coal oil. It is an excellent manure, and imparts a most healthy color to young plants, such as onions, and all kinds of grains and grasses. It never fails to invigorate young grain when applied in the Spring. It is, perhaps, the quickest and most powerful top dressing that can be used. About 40 bushels sown upon an acre of clover will about double the crop. The white fine ashes of coal contain considerable stimulants for grass as a top dressing. These consist of some lime, magnesia, aluminous earths and traces of potash. Applied to old pasture lands as a top dressing, at the rate of about 60 bushels to the acre, in April, it is very beneficial. It tends to destroy sorrel, rushes and mosses. As a compost of clay and lime is accessible to almost every farmer, its application is greatly to be recommended. It is a very durable top dressing for grass lands, and it also benefits almost any soil to which it may be applied. About 15 bushels of lime is a very good quantity to the acre, but 20 bushels may be safely used.

Vegetable gardeners blanch certain vegetables and make them very tender and palatable, while otherwise they would be hard and fibrous. This is done by excluding the light by burying them in the earth. A very subtile and intricate, but beautiful branch of science comes in here as an explanation of this phenomena.

The researches of Hunt, on the effects of light upon vegetation, have established the fact that the blue or actinic rays produce purely chemical changes; they promote the germination of the seed, but do not enable the plant to decompose carbonic acid. Very accurate experiments have proved that the growth of a plant is proportionate to the illuminating power of the solar rays. Hence those plants exposed to the action of yellow light grow more rapidly than under the influence of red or blue, because of the greater illuminating power of the yellow rays. Professor Draper, of this city, exposed leaves and grass, in tubes containing water saturated with carbonic acid, to the influence of the different rays of the sun, which were separated from each other by means of a glass prism. On examining the contents of the tubes after exposure for a sufficient period, it was found that the quantity of carbonic acid decomposed in the tube which had been placed in the yellow light was nearly double that decomposed in the tube which was