MORE EXPERIMENTS WITH IRON TARGETS--WHITWORTH AND ARMSTRONG GUNS.

We learn from our European exchanges that a new trial of guns and armor plates took place at Shoeburyness, England, on the 3d ult. Four guns were tried, viz.:—One of Whitworth's, of 7½-inch bore, with hexagonal rifled grooves; one Armstrong 9-inch smooth-bore, and one 10½-inch bore, rifled; also one of L. Thomas's rib-rifled 7-inch bore. The target consisted of several iron plates, 5, 6, 7 and 8 inches in thickness, 20 inches in width, and 8 feet in length. It was 11 feet in width and 8 feet high, with an embrasure of 3½ by 2½ feet. The plates were fastened to huge bars of iron, placed vertically and cross-wise, secured with 3-inch through bolts, screwed up behind. This target represented the strongest experimental gun-shield which has yet been constructed. The first experiment was made with Whitworth's 7-inch muzzle-loading rifled gun, weighing 7½ tuns, and nominally throwing a 120-pounder shot, though in reality made for projectiles of the weight of 150 lbs. and upward. This was loaded with 25 lbs. of powder and a flat-headed hardened projectile, weighing 137 lbs. It struck on the left side of the target with terrific force, emitting, at the moment of contact, a sheet of flame as broad and vivid as if another cannon had been fired from the mark in reply. The massive bar frame of 12 inches solid iron behind the plates was dislodged, and an 8-inch plate was cracked. The impact velocity of the shot was 1,240 feet per second. The next shot was from the Armstrong 9-inch smooth-bore, with a 100-pound round shot of wrought-iron, and a charge of powder of 25 lbs. The missile struck full upon the thick side of the target with a velocity of 1,470 feet per second, inflicting a tremendous circular dent 2½ inches deep, cracking one of the inner plates of the target, and knocking off one of the massive bolt-heads. The target was roughly shaken, but not pierced.

A new bolt was screwed into it and the third shot was fired from the 10½-inch Armstrong shunt-rifled gun. This piece of ordnance weighs 11¾ tuns. It is rifled with 10 deep grooves on the shunt principle—the shot enters freely by the muzzle down one series of grooves, but it is regularly shunted into another series, along which it comes out when the gun is fired, and the grooves for exit being shallower than those for entrance, they, as it were, squeeze the shot with sufficient force to make it take the form of rifling, and give it the rotation on its axis. It was loaded with a hollow-headed conical-shaped shot, 19½ inches in length, weighing 230 lbs., with a 45-lb charge of powder behind it. It sent the shot with a velocity of 1,465 feet per second full on the thick part of the target, inflicting a broad damaging indent, shaking the whole structure a good deal, and cracking an outer upper plate; but still there was no through penetration.

The next shot was by Lynall Thomas's 7-inch muzzle-loader. This gun was 11 feet 6 inches long, rifled on a new plan, somewhat in appearance like the *canon raye* of the French, but with this difference, that instead of three grooves it has three ridges projecting nearly an inch into the bore; the elongated projectiles, 2½-diameters long, fitting into and between the ridges. The shot fired was a wrought-iron one of 151 lbs. weight, with a charge of 25 lbs. of powder. It was the first time the gun had ever been fired, and it hit the white spot aimed at so truly as quite to obliterate the mark, doubling up the shot itself into the form of a huge cauliflower, and making an indent almost as severe as that of the 100 pounder smooth-bore. Its velocity was 1,215 feet per second when it struck. The target appeared much shaken, but was still unpenetrated.

Mr. Whitworth's gun was then again fired, at the same range and with the same charge of powder and shot. The shot was aimed at the untouched plates, below the embrasure, and so close to the ground that the projectile struck the earth first, making a deep furrow; and, of course, considerably diminishing the force of its blow. For this reason it made but a very slight impression, and did no injury to the target that was worth speaking of.

The 10½-inch Armstrong gun was again fired, with a charge of 45 lbs of powder, and a wrought-iron shot of 230 lbs. This tremendous missile injured the target considerably, and sent fragments of it flying through the air in all directions, with a hoarse roar that was terrible to hear. The force of this terrific blow broke some of the plates in fresh places, knocked the head off one of the bolts, and drove out another like a rocket.

L. Thomas's gun was again fired, with 27½ lbs. of powder, and a steel bolt weighing 133 lbs. Its maker stated he was afraid of his gun, as it was too deeply bored; and it was, therefore, fired with electricity, from a battery some distance off. When the charge was ignited the gun burst into fragments! The explosion was so complete that the masses were scattered in every direction, one piece weighing nearly a tun being thrown to a distance of 140 yards. The experiments were then terminated for the day. This gun had a steel interior tube, and an iron breech banded with a shrunk hoop 13 inches in width and 3 inches thick. The total diameter where it burst at the breech was 29 inches. It was claimed that the victory remained with the target.

Judging from these experiments, it appears that the smooth-bore gun, with a spherical wrought iron shot, was as effective as any of the rifled guns. It appears to us that Sir William Armstrong's shunt principle of rifling is one of the most erroneous ideas that has ever been applied to rifled ordnance. The fate of L. Thomas's gun is unfavorable to its character. A similar accident took place on the 26th ult., at the navy yard at Washington; while experimenting with a 50-pounder it burst, and a fragment of it, weighing 300 lbs., was hurled to a considerable distance.

The Artillery Arm of the Nation.

Some indefatigable person has compiled the following statistics in reference to the artillery now in use by the United States in crushing the rebellion.

There are now over five regiments of regular artillery in the United States service, consisting of over five thousand of the most efficient artillerists in the country. The volunteer batteries number over one hundred. A light battery consists of the following material:—Six field-pieces of brass or iron, four of which are rifled guns of 6-pounder caliber, and two 12-pounder howitzers. The requisite number of men for a light battery is as follows:—One captain, three lieutenants, six sergeants, eight corporals, two musicians, two artificers, one wagoner, and one hundred and twenty-five privates, making a total of one hundred and forty-eight men to a battery. Besides the six field pieces there are six caissons, two ammunition-wagons, and a traveling forge. The number of horses required is seventy-two.

Most of the artillery used in our service are brass pieces, manufactured at the Ames Company's works, Cabottville, Mass. They are mostly for rifled projectiles. The Parrott gun, manufactured at the Cold Spring foundry, is now generally used in the armies of the East, a few batteries of which are in the army of the West. These are very effective guns, being rifled. They are long, slim guns, gradually tapering from base to muzzle. We also use the Napoleon gun—a piece of ordnance shaped somewhat similar to the Dahlgren gun. This also is a rifled cannon, of great strength, and very effective at long range. At the battle of Antietam, a battery of these guns was served with terrible effect against a rebel Georgian regiment, literally mowing the men down in scores with its terrible storm of grape and canister.

We have now in the field some fifty-five regiments of artillery and thirty batteries, comprising about 103,105 men. This force, with six batteries to a regiment, makes the number of guns 2,160: to say nothing of the batteries of siege guns. The number of caissons is 2,160; of tumbrils, 720; and of traveling forges, 860. Seven hundred and twenty baggage-wagons are needed for this large artillery force. The number of horses required for these 360 batteries amounts to 25,340. It is estimated that we have some twenty siege trains, numbering eighty guns of heavy caliber; with these are twenty ammunition-wagons, and twenty traveling forges; the whole requiring a draft of 1,420 horses.

The pay of the five regiments of regular artillery is as follows:—The pay of officers amounts to $222,875 40, and the pay of non-commissioned officers and privates $1,174,964, making a total of $1,397,839 40. The cost of 3,050 horses for five regiments of regular artillery, at $60 83, the Government average price, sums up $12,676 50. The cost of clothing, which consists of overcoats, coats, pants, caps, shoes, shirts, drawers and socks, for the five regiments of regular artillery, is estimated to cost $159,066 60. The equipments for the regular artillery amount to $57,643 10; for small-arms, $33,130; for cannon, $16,100 28; for harness, $10,920; for caissons, $17,400; ammunition-wagons, $11,600; for traveling forges, $1,500; and the baggage-wagons, $4,350. The total cost for the support of the five regiments of regular artillery, exclusive of forage, is $1,004,128 78; but if we add forage and rations, a close estimate of which is $978,970, there will be a grand total of $2,883,008 78.

For sixty regiments of volunteer artillery, the pay of the men annually is $10,825,672 80. The cost of clothing for this vast force is $2,028,799 20; of equipments, $691,717 20; of arms, $1,069,596; of cannon, $513,920; of caissons, $208,800; of harness, $681,600; of tumbrils, $139,200; of traveling forges, $15,000; of baggage-wagons, $52,200; of forage, $2,488,320; and of rations $9,079,320. Add to this the cost and expense of maintaining twenty siege trains at $519,493, and we find the cost of keeping up the volunteer artillery corps to be $34,312,640 20. The total cost of the maintenance of the artillery of the United States, both volunteer and regular, amounts annually to the large sum of $37,195,738 98.

"I Don't Like My Business."

There is no greater fallacy in the world than that entertained by many young men that some pursuit in life can be found wholly suited to their tastes, whims and fancies. This philosopher's stone can never be discovered, and every one who makes his life a search for it will be ruined. Much truth is contained in the Irishman's remark: "It is never aisy to work hard." Let therefore, the fact be always remembered by the young, that no life-work can be found entirely agreeable to man. Success always lies at the top of a hill; if we would reach it, we can do so only by hard persevering effort, while beset with difficulties of every kind. Genius counts nothing in the battle of life; determined, obstinate, perseverence in one single channel is everything. Hence, should any one of our young readers be debating in his mind a change of business, imagining he has a genius for some other, let him at once dismiss you thought as he would a temptation to do evil. If the think you made a mistake in choosing the pursuit or profession you did, don't make another by leaving it. Spend all your energies in working for and clinging to it, as you would to the life-boat that sustained you in the midst of the ocean. If you leave it, it is almost certain that you will go down; but if you cling to it, informing yourself about it until you are its master, bending your every energy to the work, success is certain. Good, hard, honest effort, steadily persevered in, will make your love for your business or profession grow; since no one should expect to reach a period when he can feel that his life-work is just the one he could have done best and would have liked best. We are allowed to see and feel the roughness in our own pathway, but none in others; yet all have them.—*Hunt's Merchants' Magazine.*

Parrott Guns.

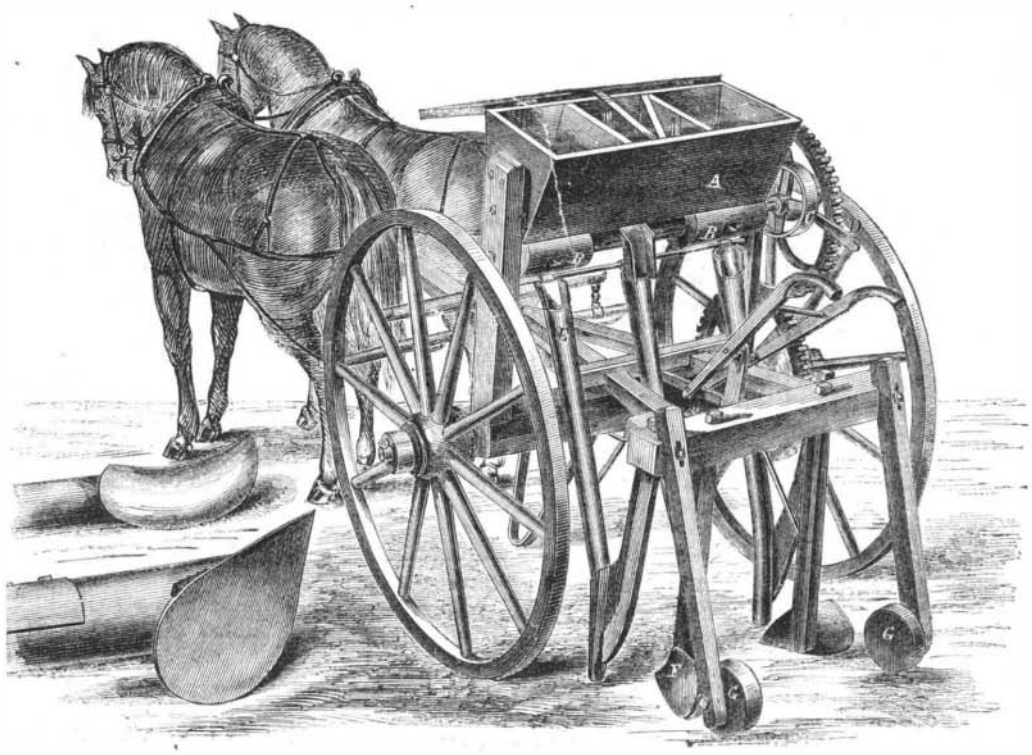
The cost of the smallest Parrott gun—6-pounder—is $200; for 200-pounders $2 000 each, which is said to be one-tenth the cost of the Armstrong gun. The charge of the powder is one pound to every ten of the ball, and the cost of powder and shell for every discharge is nearly $10. The weight of the 200-pound Parrott is a little more than one-half the weight of the Columbiad, which carries the 150 pound solid shot, or the 10-inch shell. The practice with these guns is excellent. Experiments are made daily, and with an accuracy most astonishing. The shriek of the ball, as it flies through the air at a velocity of over 600 miles per hour, is like that of a railroad train at full speed.

Poor Pussy!—It is remarkable that, although the ancient monuments of the Egyptians contain many painted figures of cats very similar to the Syrian examples now in the Zoological Gardens (London), the cat is nowhere mentioned in the canonical books of the Bible as a domestic animal.

Improved Seed Drill.

No more useful class of inventions exist than those which aid so materially in reducing the labor of the farmer and in cheapening the grain he raises. It would be a difficult task, we fancy, to reap and garner in the sheaves of grain which ripen in the harvest field, without the aid of such apparatus as have, from time to time, been illustrated in these columns. Appended are engravings of a new seed drill and plaster distributor recently introduced in the West.

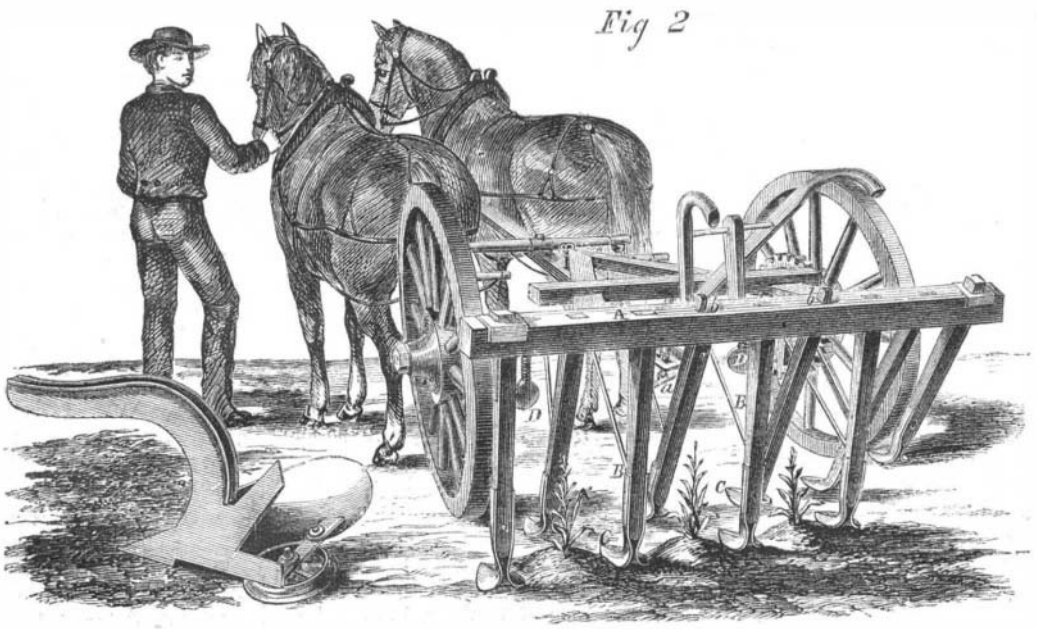
Fig. 1 shows the arrangement of the machine. The hopper, A, is divided into three compartments, which have separate apertures, B, at the bottom. In the middle compartment the plaster is deposited, and the seed corn is contained in the two end spaces. The small pulley, C, is keyed on to a horizontal shaft running through the hoppers from end to end; this shaft has a number of teeth upon it which stir up the corn and plaster and draw them over an oval aperture in the bottom. The quantity allowed to escape into the tubes is regulated by the lever, D, seen at the right. The corn deposited in the tubes, E, is plowed in or covered up by the shares, F, and the earth is then packed above by the rollers, G, or wheels following after. The standards, carrying these wheels, can be removed altogether, if necessary, or reversed, in order to suit the changes in the hollow teeth. An enlarged view of the cultivator tooth is shown at the foot of the machine, as also a representation of a plow, in Fig. 2.



TRAVIS'S PATENT SEED DRILL.

The cultivator herewith illustrated is intended for working in growing crops; it has but very few parts to it, and the efficient working of the machine would seem to be secured by the plans of the inventor. The machine (Fig. 2) consists of the triangular wooden frame, A, mounted on wheels and attached to the draught-pole by an eye-bolt; this frame has a series of arms, B, attached, which terminate in the hoes, C. The axle of the machine, on which the wheels revolve, is provided with a long wooden bar placed across it, called a bolster; this bolster can be elevated by the thumb-screws, D. The frame, A, rests upon this apparatus, and thereby adjusts the depth to which the tilling apparatus works in the soil. The plow handles terminate at the lower end in a beam, which works bearings in provided for it in the frame; this bar has a goose-neck at the furtherest extremity from the reader, which works in a slotted plate, *a*, and permits the necessary vibration required by the inequalities of the surface. It also allows the cultivators, or plows, to be moved from side to side of the crop alternately, as the farmer may desire. There is, in addition, a gear wheel made fast to the axle which is intended to operate a seeding machine placed above the cultivator when necessary. The standards, B, have keys, *b*, driven in by the side of them by which they are secured to the frame. Provision is thus made for giving a certain degree of lateral adjustment to the standards, with reference to their distance from the rows of crops. All the standards are strongly braced by the small rods attached to them from the frame; and any sort of plow, or its equivalent, may be affixed to them as they can be readily adapted to suit that form of tooth or plow best fitted to the soil in which they are to work.

Fig 2



These inventions will recommend themselves to the agricultural community by the exceeding simplicity of the working parts. Testimonials of a high character have been forwarded to us respecting their utility and economy of time and labor. These patents were procured, through the Scientific American Patent Agency, on April 8, 1862, for the inventor, Mr. A. B. Travis, of Brandon, Mich., and further information can be had by addressing him at that place.

Photographic Experiments.

The Paris correspondent of the London *Photographic News* says:—

"Messieurs Davanne and Girard have undertaken a series of researches upon the fixing of proofs by sulpho-cyanide of ammonium, as proposed by M. Meynier. They first tried its action upon albuminate of silver, and found that it was much more energetic as a fixing agent than hypo-sulphite of soda. If a certain quantity of albumen be precipitated directly by nitrate of silver, and after the precipitate is washed and treated two or three successive times by sulpho-cyanide of ammonium, the residue carefully washed, we recognize that this residue, dried and calcined, leaves only very minute quantities of silver in the ashes; while, in operating in a similar manner with hypo-sulphite of soda, the ashes contain, relatively, considerable quantities of silver. The sulpho-cyanide of ammonium appears, therefore, to present a real superiority over hypo-sulphite of soda in respect to the absolute fixing of the whites of the proofs. This sulpho-cyanide can be made to replace cyanide of potassium and hypo-sulphite of soda in all their applications. It dissolves, with the greatest facility, all the salts of silver employed in photography—chloride, bromide, iodide, &c. In the state of concentrated solution it fixes negatives very rapidly; and when employed of the strength of 15 to 18 per cent of water, it serves to fix positives. It is a substance which readily crystallizes in fine white deliquescent crystals; it therefore merits the attention of photographers, but it must be carefully studied, for, although the first laboratory experiments appear to have been perfectly successful, yet long and extensive practice may show some inconveniences attending its adoption. Among its known advantages we may place in the first rank that of allowing the operator to handle indifferently negatives and positives, fixing baths, &c., without incurring stains or any other risk."

The Hoosic Tunnel.

The great tunnel on the Troy & Greenfield Railroad through the Hoosic Mountain, is not likely to be completed very soon, although it is several years since it was commenced. The commissioners appointed by the Massachusetts Legislature to examine the tunnel and report upon it, have done so, and the Governor has sent in a message upon the subject to the Senate. In it the statement is made that the commissioners find that a period of eight years will be necessarily employed in the accomplishment of this work; and that the total estimated cost of road and tunnel, including advances hitherto made by the Commonwealth, with interest on past and future advances and expenditures at five per cent, compounded until the expected completion of the tunnel, including also the expenses of altering and enlarging the work already bored, straightening and improving the road and bridges, amounts to the sum of $5,719,330.

ALL the ten-*sous* pieces in France are t be withdrawn from circulation and melted down. New fifty-*centime* pieces will be issued, but the standard will no longer be 9-10ths of pure silver, as heretofore, but 835-1,000ths.