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(Illustrated articles are marked with an asterisk.)

SUCCESS THE POPULAR ESTIMATE OF VALUE.

Nothing is easier of demonstration than that the value of an improvement will not be recognized by the world at large, and particularly by governments, until its necessity has been proved by the failure of old-fashioned substitutes. In our late war the Government used breech-loaders, but it was only because it could not obtain muzzle-loaders in sufficient numbers. After contracting with the British for the Enfield rifle, and purchasing large quantities of the worthless Austrian muskets, it permitted, rather than encouraged, the use of our own superior breech-loading rifles. To be sure some regiments and companies were supplied, early in the war, with the Sharps rifle, but it was because the old-fashioned muzzle-loader could not be obtained, either in this country or in Europe, in sufficient numbers to arm the hundreds of thousands of soldiers which the necessities of the nation called into service. Yet at the first Bull Run battle Burnside's Division was relieved by the Second Connecticut Regiment, eight companies of which were armed with the Sharps rifle, with which the most ordinary soldier could deliver from ten to fourteen shots per minute, and the practiced man extend the number to twenty.

From the remarks of the press in regard to the Prussian needle gun, which it is claimed won the Prussian victories, the uninformed reader is led to infer that this weapon is the most effective known for infantry and cavalry. This is not so. The needle gun is a breech-loader, and in this fact alone is its wonderful superiority over the Austrian or other muzzle-loading muskets. We have had for many years much superior weapons—many of them—and they were thoroughly tested in our war, but never were the conditions so favorable for making a contrast as in the present European contest. There the whole Prussian army, of drilled men, horse and foot, were provided with a breech-loader, the use of which had been taught to them. On the other hand, the Austrians adhered to the old-fashioned muzzle-loading piece. There were two armies equipped with weapons entirely differing in operation, and the contrast, if any existed, must perforce be very marked. In our case the combatants on each side were armed very much the same, with few and isolated exceptions. Where one regiment was provided with breech-loaders, there were many others using only the common muzzle-loader. The superiority of the one over the other was shown mainly in those encounters in which a single regiment, armed with breech-loaders, was opposed to an equal or superior force, using the muzzle-loader. These exceptional cases were not important enough in their general results to attract marked attention. The assumed peculiarity of the Prussian arm is in the ignition of the charge at the base of the ball instead of at the breech. This, it is claimed, increases the velocity, and consequently, range and penetration, of the missile. But this is not a new device, nor is it peculiar to the needle gun. Breech-loaders have been constructed in this country which fired the charge at the front of the cartridge. It does not appear that in the battles fought in Europe the circumstances were favorable to the test of range, and all that can be claimed for the Prussian gun, over muzzle-loaders, is greater rapidity in delivering shots.

This was amply substantiated and demonstrated in our own contest, but because the circumstances of the trial were on a smaller scale than those in Germany, the world at large gave them very little attention. The lesson which the nations of Europe are beginning to learn from the Prussians was given in our own struggle, but unregarded because unaccompanied with the imposing circumstances which attended the late European battles.

AN ABSURD TOOL.

The latest English novelty in the way of machine tools, is a hydraulic press slotting machine. That is to say, there is a belt, pumps, and valves to drive a hydraulic cylinder, which, in turn, operates the tool, the cylinder being placed directly over the beam which carries the cutter.

In our experience with machines of this class we never remarked a lack of force or a want of simple mechanical agents to obtain it, but we have found much difficulty in getting tools to stand heavy cuts. Precisely how a complicated water cylinder, with valves, three-throw pumps, and their pistons, is to remedy this, we cannot see. There is no other trouble with a slotting machine which is not easily remedied. Not the slightest chattering is perceptible in well-made machines and work is done every day up town, in the Novelty Works, Morgan Works, and others, which can be polished without the use of a file. It is merely a question of fine feed and a sharp, properly-made tool. With these adjuncts, and soapy water, neat and beautiful work can be executed.

To complete the efficacy of this belted three-throw pump and water-cylinder slotting machine, we are informed that it has no self-acting feed "as large slotting machines are best worked without such a device—the constant attendance of the workman being necessary." This assertion will surprise many. Those who have seen a key-way cut (fed by hand) in a heavy connecting rod, and the same work done by a regular feed, will know how much importance to attach to it. It is not possible for man to feed by hand, in any thing like the same time, as regularly as an automatic arrangement for the purpose. Nor is it by such machines that we shall advance in the art of iron working. The object is to simplify, not to add to the complexity of our tools, and no advantages exist in a three-throw pump water-cylinder slotting machine that are not obtained at far less cost of construction, to say nothing of repair, in a rack and pinion, or a crank machine.

IMPORTANT DECISION---EXTENSION OF TANNERS'S CAR-BRAKE PATENT.

We have before us the decision of the Commissioner of Patents in the above case, which settles, so far as the Patent Office has jurisdiction, a question that affects the rights of inventors and assignees in patents sought to be extended.

It appears that A. G. Batchelder and L. F. Thompson applied for a patent for an improved car brake, on the 26th of June, 1847, and after an unusual delay, the patent was issued June 6, 1852, to Henry Tanner, assignee of said inventor.

In due time application was made for the extension of said patent, by Batchelder, and the administrator of Thompson. Opposition was made to this extension by interested parties, on the ground that it was not issued to the inventors, but to an assignee, consequently the Commissioner had not power under the 18th Section of the act of 1836, to extend the patent. The Commissioner, however, cites the fact that on two previous occasions decisions had been rendered, that a patent thus issued might be extended for the benefit of the inventor, and that this had been misunderstood in the Office to be the correct rule to govern its action in such cases. It is settled by judicial decisions that the term "patentee," as employed in the statute, is equivalent to the term "inventor," so far at least as to exclude any person who is merely an assignee.

The Commissioner took the broad and correct ground that the inventor only could apply for the extension; and, furthermore, that the extension would inure solely to the benefit of the inventor.

In the case of Wilson *vs.* Rosseau, Judge Nelson, for the Court, decided that the extension of a patent does not inure to the benefit of assignees or grantees under the original patent, so as to vest in them any exclusive right. But the benefits of such renewal, extended to assignees or grantees, is limited to those who were purchasers of the patented article previous to the time of the renewal, and saves to such persons the right to use the machines so purchased by them at the time of such renewal, to the extent of their interests, be that interest in one or more machines.

We understand that this decision of Justice Nelson does not, however, apply to the parties who are now using car brakes that embrace the principles covered by Tanner's patent, as they were simply licensed to use the invention for a certain term, which did not include the extended term.

THE CHARGES OF THE ATLANTIC TELEGRAPH COMPANY.

The published scale of prices of the Atlantic Telegraph Company shows that for a message of twenty words, *including* date and address of sender, the sum of £20 will be charged—which is equal to $150 American money at the present rate of gold; further, that all figures must be written out, when they will be charged as words. Messages in cipher will be double the above rates.

Vast amounts of money have been invested and sunk in laying the cable, and its permanency is at least uncertain, but it does not seem to us judicious to attempt to get *all* the money back this summer. There are not many journals or firms that can afford to have regular messages of any length, and, under the circumstances, the news transmitted would be scanty and indefinite. Heavy rates defeat the end and aim of such enterprises, which are to be a popular medium for the transaction of business. Short names will be popular, and the English language will be sorely tortured to express a great deal in a few words. The definition of "cipher messages" will have to be laid down unmistakably, and we imagine it will be difficult to draw the line.

The cable, however, is not indispensable; steamers cross in nine days; from land to land in much less time; and, except in cases of great urgency, the capacity of the line will not be taxed to its utmost, unless the tariff of charges be considerably reduced.

Doubtless the competition of the Collins Overland Telegraph will have a healthy effect, and aid materially in lowering the price.

Atlantic Telegraph---Exorbitant Charges.

We had occasion to send a telegraphic message to our correspondent in London, through the Atlantic Cable, consisting of exactly twenty words, which, according to the published schedule, should have gone forward for £20 sterling, but the director at this end charged £24, or $120 in gold, so as to cover the date of transmission.

We wish the Submarine Telegraph Company success, but it seems to us impossible that the public can submit to such exorbitant, and as it appears to us, unreasonable charges.

If this company insist upon putting in a date which was of no importance to us, we submit that we ought not to be compelled to pay $5 in gold for every word thus interpolated by the Company.

GENERAL GRANT has been promoted to the position of "General of the Armies of the United States," a grade recently created by act of Congress. There has been some bother among military men as to what device should be adopted to designate his high rank. We suggest a gold plate, with A (1) engraved upon it.