

## Science and Art.

## History of Reaping Machines.—No. 17.

Jacob J. and Henry F. Mann, of Clinton, Ind., obtained a patent on June 19, 1849. The claim embraces a double series of endless bands for raking and carrying the grain over one side of the machine, and for collecting the grain in bundles, and discharging it at once from the machine.

On the 26th of the same month, Pells Manny, of Waddams Grove, obtained a patent. His claims, are, first, arranging a series of inclined knives diagonally across spaces between the fingers, the front end of the cutting edge of one knife projecting beyond the cutting edge of the one next succeeding it, acting in combination with revolving spiral cutters. Second, attaching the pole (to whose hinder extremity the team is attached) to the hinder part of the carriage by a pivot in combination with ropes and windlasses, by which arrangement the machine can be turned in a very small space without inconveniencing the team.

On the 6th November following, D. K. and J. K. Harris, of Allensville, Ind., obtained a patent, claiming the use of a guide slot, in combination with that for the axle of the driving wheel, for allowing the wheel, or thills, or both, to fall without elevating or depressing the blades.

On the 29th of the same month a patent was granted to Eliakim Forbush, of Buffalo, N. Y., for an improved tooth in harvesting machines. The nature of the invention as stated in the specification, "consists in making an open triangular tooth of any required base, and perpendicular, or in other words, a triangular hollow tooth, which will vibrate with less friction, and clear itself, the guard fingers, and the case, from all obstructions when used in reaping." The claim is for "an open triangular hollow tooth, for cutting grass and grain."

A company has been started in this State, named the American Mowing and Reaping Machine Co., which in their circular state that they have purchased Forbush's American and English patents, which protect Forbush's reaping and mowing machine. C. W. Smith the Secretary of the Company in Buffalo, has sent us a cut containing two figs., one a reaping and another a mowing machine, but it does not show clearly that part claimed, which has only reference to the tooth.

On the 18th of December, Saml. Krauser, of Reading, Pa., obtained a patent for a clover harvester, in which the claim embraced, maintaining a series of teeth at nearly the same angle with the ground at all heights to which they may be adjusted therefrom; also forming the fingers with a depression on their upper side above the knife.

These complete the patents granted in 1849.

## Similarity of the Toys and Games of Different Nations.

I was amused here by watching a child playing with a pop-gun made of bamboo, similar to that of a quill, with which most English children are familiar, which propels pellets by means of a spring-trigger made of the upper part of the quill. It is easy to conclude such resemblances between the familiar toys of different countries to be accidental; but I question their being really so. On the plains of India, men may often be seen for hours together flying what with us are children's kites; and I procured a Jews' harp from Thibet. These are not the toys of savages, but the amusements of people more than half civilized, and with whom we have had indirect communication from the earliest ages. The Lepehas play at quoits, using slates for the purpose, and at the Highland games of "putting the stone," and "drawing the stone." Chess, dice, draughts, hockey, and battle-door and shuttle-cock, are all Indo-Chinese or Tartarian.—[Himalayan Journal.

Lieut. Maury has been elected an associate member of the Royal Academy of Sciences at Belgium.

## The Lancaster Gun.

On page 147, we presented some remarks on this much-talked-of and written-about gun. We called it simply a rifled cannon, having conical balls cast for it, each with two broad projections to fit into the grooves.

The Buffalo Democracy of the 19th ult., wishing to appear exceedingly scientific and learned upon such subjects, has criticised our remarks very freely, calling them "egotistical," and asserts that "we have committed an egregious mistake." It says "the Lancaster cannon is not at all like what that pa-



per (the SCIENTIFIC AMERICAN) would have it. The bore of this new piece of ordnance is a twisted oval so to speak, that is, the diameter of the muzzle being longer vertically than horizontally, by the time the chamber of the gun is reached the converse is the fact. Thus, for illustration, suppose a cylinder of warm gutta-percha to be molded so that the perforations shall be of an ovate form, or like the interior of some of our sewers, to use a homely comparison. Now, while the cylinder is soft, let it be held firmly at one end, and twisted half round by turning the other extremity as one would turn a gimlet or a door-handle; this would have the effect to vary the long diameter of the interior so that the bore would be a spiral oval."

What a flood of light our Buffalo brother throws upon this subject. From his description, then, we are led to infer that the Lancaster gun is made by being molded into a cylinder with an egg shaped bore, and while the metal is in a soft state, it is taken and twisted by some kind of rope-making machine into a bullet gimlet.

We here present an engraving exhibiting, by figs. 1 and 2, two transverse sections of the Lancaster gun, one exhibiting the usual circular bore of the barrel, with the dotted lines outside, to show the oval grooves which are cut out (not molded,) and the other shows the section of the cannon with the two grooves cut out, the dotted lines showing their departure from a circular bore.

We called these "rifled grooves," and we can look upon them as nothing less; other experts, like the Editor of the Buffalo Democracy, who know so much about such subjects, may call them a "twisted oval." That we have made an "egregious mistake," seems clear to the editor of the Democracy. To our readers it will probably seem equally clear, i. e., as clear as mud.

At the time we made the remarks referred to by the Democracy, we had not consulted good authorities in reference to their opinions on the question—we gave our own view of the subject. When the copy of the Democracy reached us—marked, and sent by the Editor to enlighten our dark mind—we thought we would consult Mr. Wm. Lancaster himself, the inventor and maker of the gun. His opinions we have obtained, as published on page 219, Vol. 10 London Patent Journal which contains fig. 1, and the substance of his patent, when it was enrolled on Jan. 3rd, 1851. That specification does not contain a single word about a twisted oval. It is as follows: "The patentee proposes to form the grooves or rifling, so that angles shall not be formed; the grooves proceeding in a tangential line with the plain cylindrical bore of the barrel, as shown in this figure, which represents a section of the barrel groove and rifled according to the improvement. The dotted lines show the cylindrical bore in fig. 1, and the full lines show the grooving or rifling, which is extremely wide, and commences in a tangential direction to the cylindrical bore, or nearly so; thus, no angles are formed, or if there are any, they are so minute as not to be appreciable. Two grooves are shown in the figure as adapted to the bore, but the patentee does not confine himself to this number, as three or four may be employed as desired." This we have quoted from the specification in the Patent Journal, which also describes a machine for cutting out

these grooves. If we are wrong, and cannot appreciate the science of the Buffalo Democracy, with its twisted oval, egg sewer, soft gutta-percha cylinder, and gimlet, we are happy to be found in the company of Mr. Lancaster himself.

Our Buffalo brother in his zeal to rescue the science of gunnery from our ignorance, describes the ball of the Lancaster gun, and the way it is used, as follows:—

"The missile used is of an ovate form, or egg-shaped also, but is not forced down with its long diameter presenting to the sides of the bore; it is placed in the muzzle just as the eggs upon the reader's breakfast table are inserted in their cups or rings, and the rifle-like revolution upon its long axis is acquired by its being forced to follow the twisted, or in effect, the grooved channel of the cylinder. This is the whole story. And the probability is, that it will be found an impracticable invention; for, if the gun be slightly overcharged, the unyielding iron egg, too much in haste to follow the circuitous course prescribed for it, will attempt to leave the gun by the most direct route, and so will cause the bursting of the piece. Indeed, several of these guns have already bursted in the trenches before Sebastopol."

Here we are told that the cast iron egg is placed in the cannon like an egg in an egg-cup. Fig. 3 shows the old fashioned American picket bullet, the egg. The only way to place the egg-ball properly in the gun, is with its large end on the powder, from which we infer our Buffalo brother is in the habit of eating out of the small end of the egg. Or if he, like a sensible person, eats out of the large end, then what a splendid gunner he would make, by inserting the egg ball with its narrow end on the powder. The stupid part of the above description of using the ball, consists in asserting that it is placed in the gun with its minor axis in the bore. In that case, the charge of powder will always flash out through the grooves; this is self-evident. By the method described by the Democracy, of charging a Lancaster gun, it would not burst if fired from now till the year 1900; the ball will not be required to follow a circuitous route, it will not spin upon its axis; and if it seeks to leave the gun by the most direct route, that route must be by the butt. When Dick Van Brunt went to shoot his father's pig, and missed at three yards distance, he declared "the bullet went out the wrong end of the gun." If our Buffalo brother was commanding a Lancaster gun at Sebastopol, being fearful of an overcharge of powder, and loading with the ball in the manner he has described, he would just accomplish as much as Dick Van Brunt, but would have to offer a worse excuse, namely, "The powder went out but the ball stuck in."—"This is the whole story."

## Gunpowder.

The Liverpool (England) Standard says: "Some of the effects of ignited gunpowder are wonderful. When gunpowder is heaped up in the open air and inflamed, there is no report, and but little effect is produced. A small quantity open and ignited in a room, forces the air outwards, so as to blow out the windows; but the same quantity confined with a bomb, within the same room, and ignited, tears in pieces and sets on fire the whole house. Count Rumford loaded a mortar with one-twentieth of an ounce of powder, and placed upon it a twenty-four pound cannon; he then closed up every opening as completely as possible, and fired the charge, which burst the mortar with a tremendous explosion, and lifted up its enormous weight.—In another experiment, Count Rumford confined twenty-eight grains of powder in a cylindrical space which it just filled, and upon being fired, it tore asunder a piece of iron which would have resisted a strain of four hundred thousand pounds."

## Not to Ridicule or Despise New Things.

The world's history is full of the persecution of great men, who stepped forward in advance of their age, warning us to look kindly on honest purposes, and to judge with

charity what we do not comprehend. Let us not ridicule or despise new things because they conflict with our observation or seem to be impracticable. There is hardly a discovery or invention in art that has not had its day of trial and discouragement. Many a man has gone heart-broken to his grave, in whom the fire of genius has burned, unseen and unappreciated, when adverse circumstances, or shrinking timidity, or cold neglect, or the want of a kind word, has come like a mountain upon him and kept his secret buried forever. Prison bars have been pressed by throbbing brows which would have redeemed the world. The records of the world are full of the neglect of merit.

## LITERARY NOTICES.

TECHNOLOGICAL DICTIONARY OF ENGLISH, FRENCH, AND GERMAN LANGUAGES.—The second part of the above named Dictionary by Messrs. Tolhausen & Gardissal, Civil Engineers, Paris, has just been received by us; the first part consisted of a dictionary—with the French words first, then the English, and then German; the second part has the English words first, then the French, and German. The next part will have the German words first. No person who wishes to understand the meaning of English, French, and German terms, should be without the whole of this dictionary. The price of each part is \$1.50. This Dictionary is destined to the general use of engineers, artists, manufacturers, and artisans, in short of all those who, in some way or other, are concerned in arts and manufactures. The frequent and almost daily international exchange of English, French, and German publications renders a faithful interpreter of the terminology proper to each of those languages highly necessary. The present work is the key through which the reader may penetrate into a language which he may know but imperfectly; it is the instantaneous translator of the corresponding technical term, or its equivalent, in the three great industrial languages.

NEWTON'S LONDON JOURNAL.—Published monthly by W. Newton, at his office, No. 66 Chancery Lane, London. This venerable publication commenced in 1820, and has up to this time maintained the character of a well conducted and substantial journal of "Arts, Sciences, and Manufactures." The 4th volume commenced with the January number, and the Editor announces that the price per annum will be twelve shillings, about \$2.50 our currency. We hope his anticipations of profit from an extended circulation will be fully realized. The progress of industry will be treated with more attention by the journal in future, thus conferring increased value upon the artisan and manufacturer.

THE ARTISAN.—A monthly record of the progress of steam navigation, ship building, engineering, chemistry. Matthew Soul, publisher, No. 20, Paternoster Row, London; sold by G. H. Haswell, No. 6 Bowling Green, New York. The 2nd volume of this publication commences with the January number. It is a well edited, popular work, and contains much valuable matter, alike interesting to the inquirer and mechanic. The facts and figures, illustrative of the strides made in steam navigation and in shipbuilding are very useful to commercial and practical men. "A practical chemist" contributes his monthly notes, and adds much to the value of the work.



## Inventors, and Manufacturers

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