

Science and Art.

Experiments with the Chinese Sugar Cane.

Some of the seeds of the Chinese sugar millet having been obtained by Ex-Governor Hammond, of South Carolina, he has recently reported the results of his experiments, which have been published in the *Charleston Mercury*. He planted a pint of seed on half an acre of rather poor soil, on the 22nd of last March; the seeds were dropped 18 inches apart in 3 feet wide rows. When the plants came up they were frequently hoed, to keep down grass and weeds. On the 22nd of July some of the advanced heads had passed the milk stage, and he had a rude mill put up, consisting of two wooden rollers, to ascertain whether the millet would make syrup. About 1750 canes were cut, and 400 passed through the rollers twice, and the remainder four times; the yield was 194 quarts of juice, and ten selected canes put through the mill seven times, yielded three quarts. The juice was received in common wooden tubs, and tested with a thermometer, and a sacchrometer having a scale of 40 degrees. The temperature of the juice was 78° Fah., the strength 23.5°, and floated a fresh egg. It was boiled in a deep old-fashioned cow pot, for seven hours, and yielded 32 quarts of tolerable syrup. Next day he selected more of the canes in different stages of progress, and submitted them to the mill seven times, and from every 10 again obtained 3 quarts of juice. This was also boiled, and he obtained a rather better syrup. To every five gallons of the cold juice a teaspoonful of limewater was added. The canes were one inch thick at the butt, and seven feet long, after cutting off the head. The syrup was equal to the best New Orleans. Respecting this plant, Ex-Governor Hammond says: "I did not attempt to make sugar, not having prepared for that. There can, however, be no doubt that sugar can be made from such syrup as this. And, as they make more syrup in the West Indies per acre than they do in Louisiana, only because the cane matures better, it is not unreasonable to infer that the millet, which matures here perfectly, and will even make two crops in one year, will yield more and better sugar than the Louisiana cane.

Beginning to cut the cane as soon as the head is fully developed, it may be cut for a month before it will all ripen—how long after that I do not know. A succession of crops might be easily arranged so as to insure cutting and boiling from the 1st of July—probably earlier—until frost. I have housed some stalks immediately from the field, to ascertain, hereafter, whether thus treated it will yield juice and make syrup next winter."

Sugar has now become a most important article of food; it is used for more purposes of cookery than any other agricultural product, and the demand for it is increasing more rapidly than it can be supplied. This is the cause of its recent great rise in price. We have been assured by a large dealer in sugar and molasses, that our Western States alone now consume more sugar than is produced in our whole country; hence we are dependent for the most of that which we use on the West India islands, Cuba especially. It would certainly be of great advantage and benefit to our people if our country produced as much sugar as it consumed and required. This it never will be able to do, we believe, from the common sugar cane, because the climate most suited to its culture in any of the States is not equal to that of the West India Islands—rather—it is not properly adapted to the climate of any of our States. We therefore hope our southern planters will give the Chinese sugar millet full and fair trials, and we hope that it may yet prove to be the source from whence our country will be able to supply itself with an abundance of good sugar, syrup, and molasses.

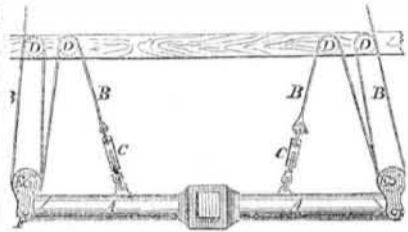
Photographic Bank Notes.

An artist in Paris, M. Agnado, has succeeded in deceiving the most expert clerks in the Bank of France with photographic copies of bank notes. It was found to be impossible to tell the copied from an original one thousand franc note.

English Patents.

Kidman's Improvement in Tillers or Yokes.

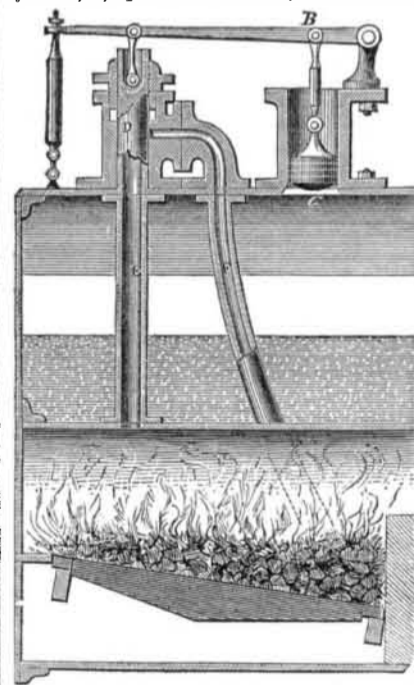
This invention consists in making the standing part of the steering rope or chain fast to the tiller or yoke, the rope or chain being then led through side sheaves or blocks to single or double sheaves or blocks in the tiller or yoke, and then through other single or double side sheaves or blocks to the barrel of the steering wheel. By this arrangement, all the slack of the steering rope or chain is taken up, and an additional purchase obtained over those arrangements in which the standing part of the rope or chain is made fast to chocks or carlings at the sides of the tiller or yoke, and not directly thereto. It is preferred with a single purchase to place the after side sheaves in such a position that one shall be abaft and the other ahead of their corresponding sheaves in the tiller when that is hard over, or at an angle of 45°, or thereabouts, with the fore and aft line of the vessel.



In order to take up conveniently the little slack that may result from the stretching of the steering rope, when rope is used, instead of attaching the standing part of the rope directly to the tiller or yoke, it is attached to a screw shackle (or by a lashing, if preferred,) which is connected by an eye bolt or otherwise to the tiller or yoke. By means of this screw shackle, the small amount of slack in question may be readily taken up.

The cut shows a plan of an arrangement, when movable sheaves or blocks are fitted at each end of a yoke. A is the yoke; B is the steering rope or chain; C C are the screw shackles attached to the yoke, A; D D are the sheaves, and E E the single sheaves on the end of the tiller. These latter sheaves are capable of revolving about a pin, F, passing through the yoke, in order that the steering rope may be led more fairly to the side sheaves, D, when the yoke is in any other than the fore-and-aft position.

Hackett's Improved Safety Valve for Boilers.—The object of this improved valve is to secure boilers from explosion. The ordinary safety valves are supposed to be loaded to 50 lbs. per inch. The new valve consists of a cylinder, C, open at the bottom, fitted with a



steam-tight piston, having metallic packings, the piston being exposed to the action of the steam. The top of the piston is pressed down by springs giving a resistance of 80 lbs. per inch. Connected with the piston is a valve, D, for the admission of water from the boiler on to the fire. When the piston is pressed upwards, the valve, D, moves upwards through three times the space of the piston, and by this means opens the communication, F, between the boiler and fire grate. When steam

is up in the boiler, the superincumbent pressure of steam would force water into the pipe, F, thus causing a constant flow of water through the valve D over the fire grate. It will appear that when the pressure in the boiler exceeds 80 lbs. per inch, the piston in the cylinder, C, will be forced upwards and open the communication for the water to extinguish the fire, and thus prevent the possibility of an explosion.—[London Engineer.

Cultivation of American Indigo.

The sulphate of indigo (chymic) is used in great quantities for coloring silk and woolen goods, and fine sheepskins. It is the principal coloring ingredient for light blues and greens. It is made by dissolving finely pulverized indigo in pure strong sulphuric acid. The very best of indigo is required for its manufacture, because inferior indigo requires more sulphuric acid while it gives out far less coloring matter, thereby involving a loss of material in connection with an inferior product. All indigo contains more or less lime, but the inferior kind the most; this is the reason why it takes up more sulphuric acid to manufacture an inferior chymic.

At the present moment, and for the past two years, the supply of the first quality of indigo has not been equal to the demand for it, and that demand is constantly increasing. Some very excellent indigo, well adapted for making chymic, used to be obtained from Guatamala, but the kind most esteemed is the first quality of Bengal, for which we are dependent on a colony of Great Britain.—About twelve years ago, the best Bengal indigo could easily be obtained, but at present it is almost unknown in the market. A spurious article, however, much resembling it, is abundant, but it does not possess one half the coloring matter of the genuine, and yet it is sold at a retail price varying from six to fourteen shillings per pound.

Our object is to direct the attention of our southern planters to the cultivation of the indigo plant, and the manufacture of the best kinds of indigo, for inferior kinds are by far too plentiful.

About sixty years ago—and within that period—some very fine qualities of indigo used to be cultivated in South Carolina; its character was much higher than the finest Guatamala or the best Bengal, but it is now unknown in the arts, to the great regret of calico printers, dyers, and leather dressers.—In the fermentation of the indigo plant so much oxygen is absorbed that its manufacture was found to be very injurious to the health of the negroes on the plantations; this was one reason for giving up its culture; and another, and perhaps the strongest, was the higher profits derived from the cultivation of cotton. It appears to us now, however, that with the exercise of sufficient care, the health of the negroes may be maintained as well as in the rice culture; also that the price which could now be obtained for it would be very remunerative. There are hundreds of persons in our country who would rather pay two dollars per pound for the best kind of indigo—that quality which was manufactured at one time in South Carolina, or the kind that was sold for the best Bengal twelve years ago—than that which is now sold for seventy-five cents per pound. We think these considerations ought to induce some of our planters to engage in the cultivation of the finest qualities of indigo.

Since our planters have beat all the efforts of the East India Company to rival them in the cultivation of cotton, it appears to us that their honor is somewhat at stake to regain their lost reputation in the cultivation of indigo.

The golden crops of California are still abundant. The steamer *Illinois* arrived at this port on the 29th ult., with one million and a half of the yellow metal.

A joint stock company has been formed to deepen the Illinois river, and render it navigable at all seasons. This is a commendable enterprise.

The latest accounts from Polynesia describe severe shocks of earthquakes in Hawaii.

Literary Notices.

THE WESTMINSTER REVIEW.—This able Review for the present quarter contains a most interesting, and on the whole, very impartial article on Foreign Missions. It ought to be extensively read and pondered. The Natural History of German Life, etc., Popular Amusements, Froude's History of England, &c., form subjects for other essays. It is a capital number. Published at 51 Gold st., by L. Scott & Co.

THE LONDON QUARTERLY REVIEW. Just issued, contains seven very able articles.—Savonarola, Grote's History of Greece, Causes of Civil War, principally based upon the more recent publication of M. Guizot. The Police and the Thieves. Public Works and Improvements of Paris; a charming article for those who have visited this famous city. The Papal Government, and the Disputes with America; in which the writer takes up the cudgel in right good earnest, in behalf of the sincerity and good faith of our (the British) nation. An Englishman does not like to admit the possibility of wrong doing on the part of his Government. England is always magnanimous in the eyes of an Englishman. All right—we do not object; but, we do insist upon it, that America and Americans, are not always blindly contending for wrong. We are among those who think there is yet remaining a little virtue and good manners among us. Leonard Scott & Co. are the re-publishers of the British Reviews.

BLACKWOOD'S MAGAZINE.—The present number of this veteran Magazine, opens with a criticism on Macaulay's late volume, which is brilliant, but not very pointed. The story of the "Athelings" is continued. There is a review of Prof. Aytoun's poem, entitled "Bothwell," in which it is stated, he is not the editor of this magazine, as has been generally supposed. "India, under Lord Dalhousie," is the best article, we think, in the number; it is full of information. Published by Leonard Scott & Co., No. 54 Gold street, this city.

THE AMERICAN VETERINARY JOURNAL.—This is a monthly periodical devoted to the diffusion of veterinary knowledge, edited by Geo. H. Dod, Veterinary Surgeon, and published by S. N. Thompson, Boston. We hail it as a new co-laborer in the walks of science. It is edited with marked ability, and is neatly printed. It contains much sound and useful information, relating to domestic animals, and deserves a very extensive circulation.

UNITED STATES MAGAZINE for September, contains an illustrated article upon the President's House, at Washington. This house is one of the marks of our republican simplicity, inside and out, and if any of our readers are curious to know all about the "White House," let them procure a copy of this Magazine. Future aspirants for this domicile will be anxious to look upon it in picture, if not to embrace its realities. J. M. Emerson & Co., N. Y., publish the United States Magazine.

THE OLD VICARAGE, by Mrs. Hubback, is a novel of an interesting and thrilling character. A sound morality seems to pervade its narratives and conversations. It appears to be a book that may be read with interest and satisfaction. Fetridge & Co., Publishers: New-York and Boston.

THE ORPHAN SISTERS, is an interesting novel by Mrs. Marsh. For sale by E. D. Long, Ann-st., New-York.



OF THE

SCIENTIFIC AMERICAN.

TWELFTH YEAR.

Read! Read!! Read!!!

The most extensively circulated, the most interesting, reliable, attractive, and cheapest publication of its kind, is the *SCIENTIFIC AMERICAN*. It has, by far, the largest circulation, and stands, by common consent, at the head of all other scientific papers in the world. Its contributors and Editors are PRACTICAL, ENERGETIC, and EXPERIENCED MEN, whose constant endeavor is to extend the area of knowledge, by presenting it to the mind, in a simple, attractive, and practical form.

The *SCIENTIFIC AMERICAN* is printed once a week, in convenient quarto form for binding, and presents an elegant typographical appearance. Every number contains *Eight Large Pages*, of reading, abundantly illustrated with ORIGINAL ENGRAVINGS.

All the most valuable patented discoveries are delineated and described in its issues, so that, as respects inventions, it may be justly regarded as an ILLUSTRATED REPERTORY, where the inventor may learn what has been done before him, and where he may bring to the world a KNOWLEDGE of his own achievements.

REPORTS OF U. S. PATENTS granted are also published every week, including Official Copies of all the PATENT CLAIMS. These Claims are published in the *SCIENTIFIC AMERICAN* in advance of all other papers.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and People of every Profession in Life, will find the *SCIENTIFIC AMERICAN* to be of great value in their respective callings.

Its counsels and suggestions will save them *Hundreds of Dollars* annually, besides affording them continual source of knowledge, the experience of which is beyond pecuniary estimate.

A NEW VOLUME commenced September 13, 1856. Now is the time to subscribe! Specimen Copies sent gratis.

TERMS OF SUBSCRIPTION—\$2 a year, or \$1 for six months.

CLUB RATES.

Five Copies for Six Months,	\$4
Five Copies for Twelve Months,	\$8
Ten Copies for Six Months,	\$8
Ten Copies for Twelve Months,	\$15
Fifteen Copies for Twelve Months,	\$22
Twenty Copies for Twelve Months,	\$28
For all Clubs of 20 and over, the yearly subscription only \$140.	
Post-pay all letters, and direct to	
MUNN & CO.,	
128 Fulton street, New York.	