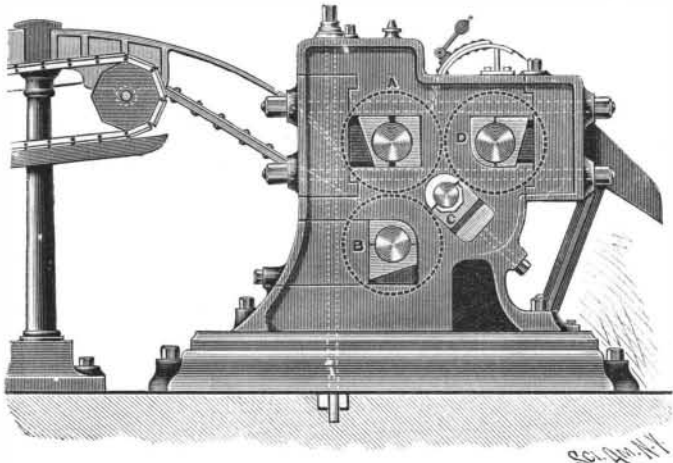


AN IMPROVED SUGAR CANE MILL.

The canemill shown in the illustration is designed to utilize the crushing power to the greatest advantage, without injuring the headstocks, the mill also proving very economical of power in comparison with the work done. It is said that one of these mills recently erected in the island of Barbados has proved a complete success extracting 71 per cent out of 100 pounds of cane, or very nearly equal to that ordinarily obtained by double crushing with two mills of three rollers each. The mill forms the subject of a patent recently granted to Mr. Donald Skekel, of Georgetown, Demerara, British Guiana. The two top rollers, A and D, are secured by horizontal bolts, which may be tight-

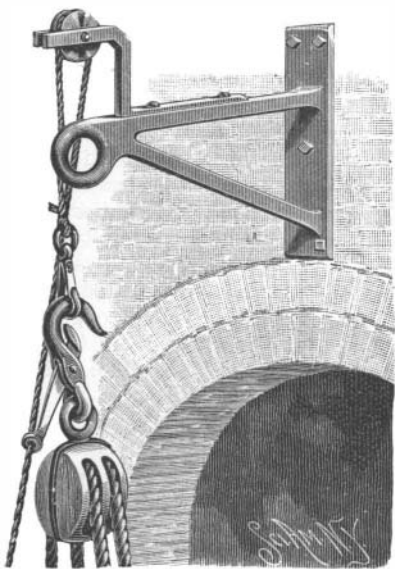


SKEKEL'S SUGAR CANE MILL.

ened up by means of nuts on their ends, and vertical bolts secure the lower roller, B, these bolts having collars on their lower ends and tightening nuts on their upper ends. In the headstock, opposite roller B, is a tongued and jointed removable piece, to facilitate removing the latter roller when desired without taking down the mill. The cane, after passing between the front or entrance rollers, A B, is passed up between the two top rollers, A D, the juice pressed out passing down by its own gravity and being conducted to a suitable receptacle. To guide the cane from the entrance rollers upward between the top rollers, A D, a corrugated roller, C, is driven by suitable gearing to travel at the same velocity as the other rollers, pushing the cane upward to undergo the final crushing. By means of a screw bolt with a nut on its outer end the corrugated roller may be adjusted to give the friction required to pass the partially crushed cane upward. Suitably arranged guides prevent the passing of the cane to the bearings of the rollers, and to prevent the bagasse from being carried over to the feeding side of roller A, a hinged hood is held in contact with the surface of the latter roller by a weighted lever. All parts of the mill are easy of removal, and the bearings may be conveniently lubricated, while the liability of any breakage of the headstock is reduced to a minimum.

A HOISTING DEVICE AND SUPPORT.

The illustration represents a device for conveniently hoisting a tackle or other apparatus from the ground or the deck of a ship to its position of use, and automatically engaging the tackle upon its support. The improvement has been patented by Mr. Henry Sellheim, No. 532 Pearl Street, New York City. A bracket



SELLHEIM'S HOISTING DEVICE.

carrying a pulley is secured upon the top of the tackle support in such a manner that the pulley will be above the ring or eye of the support, both ends of a rope passing over the pulley being in the hands of an operator on the ground. A spring hook attached to one end of the rope is hooked upon the tackle hook, and the other end of the rope is passed through an eye

on the outer end of a lever pivoted on this hook. As the tackle is then raised by pulling upon the rope, the tackle hook is readily manipulated to engage the eye of the support, while the lever pivoted on the hook may be made to close its open end, preventing the disengagement of the spring catch. When the job of hoisting has been finished, the tackle may in like manner be disengaged and lowered to the ground.

Armour's Electric Railroad.

An elevated electric railway has been established at the stock yards at Chicago. It connects all the P. D. Armour warehouses and slaughter houses. There are, says the *Engineering News*, about 6,000 ft. now completed and about two miles of extensions are being built. The track has a gauge of 3 ft. and is 23 ft. above the ground. Where the line runs between the main buildings the structure is of steel; elsewhere it is of Georgia pine. The numerous switches necessary to reach all parts of the buildings made the construction difficult to plan satisfactorily. The ironwork was designed and erected by Mr. John Bouchard, master mechanic for the Armour Company. The electrical work was done by the Thomson-Houston Company, under the supervision of Mr. A. Shillinglaw, electrician for the Armour Company. There are in service two 20 horse power locomotives of the standard Thomson-Houston type. The cars may be run off the rails on to the floors of the different houses. The power house is located about a quarter of a mile from the road, and will be some distance beyond that when the company moves into the new electric station, occupying a building 125 by 150 ft., and comprising three stories, built of steel and brick, with the engines located on the first floor, shafting on the second and dynamos on the third. Current for the present equipment is supplied from a Thomson-Houston 135 horse power generator, and there is also ready for service a National 80 horse power machine.

The World's Cotton Production.

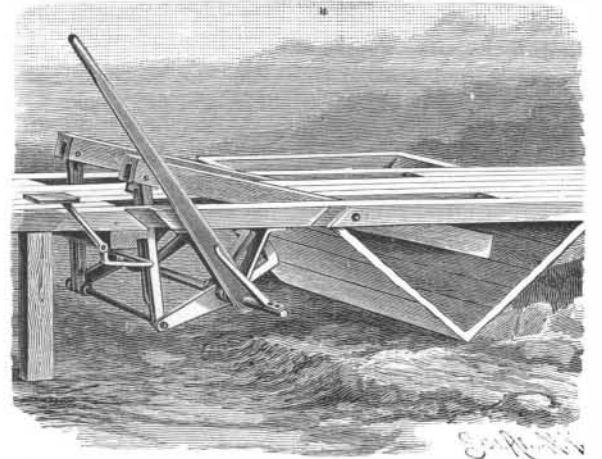
The total crop of the world for 1891 is placed by one statistician at 12,570,000 bales, averaging 400 pounds weight. Of this the United States is credited with having produced 8,652,597 bales, averaging 480 pounds each, or more than three-fourths of the world's entire crop, in pounds. The East Indian product, of considerably less than a million bales, comes next. Egypt is third on the list. The average supply of the world's cotton for six years ending 1891 was 9,928,000 bales, of which the United States produced 7,659,000 bales, all other countries making only 2,269,000 bales. The acreage of culture is increasing more rapidly in the United States than in any other country. Until recently, Florida gave to the world the highest export of the sea island cotton, the most valuable of the cotton fibers, but during the year 1890-91 Georgia went highest, South Carolina coming next—the fruit industry of Florida having doubtless supplanted the cotton industry there.

The staple reaches its highest general price in England and on the Continent of Europe, where it is consumed by manufactures. The rates of freight to Liverpool from the different countries where the fiber grows usually determine the prices paid to the producer of the raw material. Planters living nearest the great shipping ports of our Southern and Gulf States are supposed to receive the very highest of all prices paid for the fiber—the lowest prices for good cotton being seen in South America and Asiatic localities where it is grown.—*Atlanta Constitution*.

AN IMPROVED GRAIN DUMP.

The illustration represents a simple, durable and inexpensive structure, so built that the pit to receive the grain need not be sunk into the ground, or may be sunk only a slight distance, while dust or foreign matter, fluid or solid, will not interfere with the action of the dump timbers in cold weather. The improvement has been patented by Mr. John P. Peterson, Worthington, Minn. The platform is mounted upon standards or other supports at the desired height from the ground, provision being made for readily driving upon and away from it; and in the platform, about the distance apart of ordinary wagon wheels, are lengthwise openings, in each of which a dump timber is pivoted. Beneath the platform are brackets in which is journaled a shaft under the rear ends of the dump timbers, and extending downward and rearward from this shaft are arms connected by a cross rod, the latter being pivotally connected by upwardly extending bars with the dump timbers. Latch links from the cross rod extend upward through the platform, these links being adapted to enter recesses by which the dump timbers are held in horizontal position. The connecting rods, links and dump timbers are practically counterbalanced by counterpoise weights on the shaft, from one end of which a lever extends up within a guard yoke on the edge of the platform, the lever being designed to engage oppositely inclined

recesses in the side of the platform, the dump timbers being closed or in their horizontal position when the lever is in the rear recess and elevated when the lever is in the forward recess, a spring bearing against the outer face of the lever. Before the dump timbers can be elevated, the latch links must be released, which is

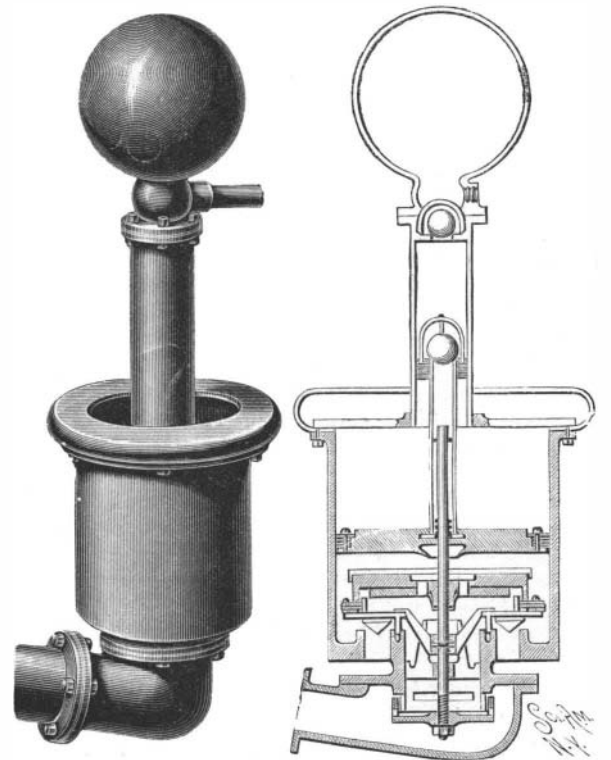


PETERSON'S GRAIN DUMP.

effected by a lever having a foot plate on its upper end, after the vehicle is driven upon the platform, with its wheels on the dump timbers, the hand lever then being operated to incline the dump timbers and the vehicle, so that the contents of the latter will be deposited in the hopper.

AN IMPROVED HYDRAULIC RAM.

A simple and compact ram, by which water may be elevated to a considerable height by a stream having but a small fall, the water being discharged in a continuous flow, is shown in the accompanying illustration. The improvement has been patented by Mr. Lewis T. Webster, of Northfield, Mass. In the lower end of the inlet pipe is a valve with a central hub screwed on the lower end of a piston rod extending upward within a hollow interior piston rod or pipe, the lower end of the latter being screwed or otherwise secured to the top of a piston reciprocating in the large lower cylinder, around the bottom edge of which are the outlet valves. The interior pipe piston working in the central smaller pipe, or pump barrel, has at its upper end a check valve, and a ball valve rests in the passage from this pipe to a hollow casting at the top forming an air chamber, from a lower extension of which leads the outlet pipe. The water entering the ports of the valve at the bottom, both pistons being imperforate, flows up through the piston of the large lower cylinder, and into and through the interior pipe piston, entering also the smaller central pipe, or pump barrel, the water raising the large piston, and its upward movement carrying with it the interior pipe piston, forcing the water past the ball valve and into the discharge chamber. As the large piston reaches a point near the top of its cylinder, the central valve rod is raised, closing the inlet and opening the outlet



WEBSTER'S HYDRAULIC RAM.

ports, until the dropping of the large piston again opens the inlet and closes the outlet ports. Around the central valve rod is a spiral spring to prevent excessive shock in the working of the ram. The combined pressure from beneath and the air pressure from above are designed to cause the water to flow from the discharge pipe in a steady stream.

A Marvel of Egyptian Antiquity.

The question of the irrigation of Lower Egypt is now, owing to the high Nile, attracting increasing attention. Under these circumstances it can hardly fail to interest our readers to have recalled to their minds the theory connected with the name of Mr. Cope Whitehouse, as to the locality of Lake Mœris. Briefly this was described by Herodotus, who wrote, moreover, of what he had himself seen, as a lake not far from Memphis (Cairo), some 450 miles in circumference, and fifty fathoms deep, full of fish of twenty-two species, used as a receptacle for the surplus waters of the Nile in flood, whence, when the Nile was low, sufficient water could be drawn to raise the river level again to the height required for the continued supply of Lower Egypt. Of this marvel of human ingenuity and industry Herodotus could find no words adequate to express his admiration, excelling, as it did, in his opinion, the Labyrinth, which again excelled all the Pyramids together, though any one of these was a match for the greatest works of Greece. Diodorus Siculus described the lake in almost similar terms, and Strabo, Pliny, and Mutianus all testified to its existence, while the Ptolemaic map gives a representation of it, not, indeed, indicating such enormous dimensions, but still indicating a vast body of water to the south and west of the Fayoum. Careful collation of all the old accounts enabled Mr. Whitehouse, as he thought, to fix the latitude and longitude of this abyss before he ever set foot in Egypt, and whether or not what he found was the site of the ancient Lake Mœris, this much is incontestable—namely, that he found a vast depression in the hills toward the Libyan desert, the depth and extent of which had never been suspected even by those who had tracked across it. This depression is known as the Wady Raiyan, and lies to the south and west of the modern province known as the Fayoum, from which it is separated by a narrow ridge. Herodotus described Lake Mœris as having its greatest length from north to south. This would be true of either the Fayoum or the Wady Raiyan separately (this latter having a singular prong of great length, called the Wady Muellah, stretching away toward the southeast), and it would be equally true if, as is probable from the dimension given, the lake covered both the Fayoum and Wady Raiyan together. If the entrance from the Nile Valley at El Lahun is not altogether artificial, the whole double basin was probably originally a great natural backwater for the water of the Nile in high flood. Mr. Whitehouse considers that the Fayoum was in great measure reclaimed when the Bahr Jusuf was made and dams erected at El Lahun, presumably between B. C. 1500 and 1800, and certainly not later than the Hyksos period; and in the name Bahr Jusuf, or Canal of Joseph, and the persistent Mohammedan tradition that the canal was made by the patriarch Joseph, he sees evidence that these great reclamation works were carried on during Joseph's premiership, and very likely in the main by the Israelites. There can be little doubt that Goshen, where they dwelt, was this district.—*London Saturday Review*, September 24.

Vanilla.

Notwithstanding the various preparations that have lately been put upon the market as substitutes for the vanilla for flavoring purposes, a great deal of attention is still directed to the cultivation of the plant and the preparation of the fruits for commercial purposes. Perhaps the most recent and formidable rival in the cultivation of vanilla is Fiji, from whence some good samples have more than once been received. The first consignment sent to London brought from the consignees a very congratulatory report on the prices realized, namely, 22s. 6d. per pound for three-fourths of the consignment and 21s. 6d. for the remaining fourth. The consignees further say that "unless the quality had been very satisfactory no such price could have been obtained, and if further consignments are up to the quality now sent in, we can say that Fijian vanillas will command a good price and a great sale. Speaking from an experience of nearly forty years, during which we have handled a considerable quantity of vanillas, we can unhesitatingly say that the quality of that sent here is equal to any vanilla grown in the Mauritius or elsewhere. The beans are plump and well cured, and are beginning to throw out splendid crystals. In future consignments it will be necessary to sort the vanillas and tin them according to lengths, and to take care not to pack the tins too closely."

In connection with the subject of the preparation of vanilla for market, one of the most striking departures from the ordinary mode of drying the pods seems to be that of keeping them moist, or rather wet, for some sample pods have recently been received in London preserved in alcohol. They are described as of fine appearance and good aroma, though, of course, partly exhausted by the action of the spirit, which, it has been suggested, will probably be sold with the beans. It is said that "by placing the pods in alcohol when freshly gathered, a much more fragrant tincture is obtained than by exhausting the cured beans purchased in Europe."

CONJOINED TWINS.

These new "Siamese Twins" do not come from Siam. They are natives of Orissa, in India, and the following description is sent to us by a correspondent, who saw them the other day in Poona. They are to appear, we believe, at the Aquarium, previous to fulfilling their engagement at the World's Fair, Chicago. The names of the children are Radica and Doddica. The two little girls are three and a half years old, and are really pretty children. The peculiarity of their connection is that there is a flexible bony attachment from breast to breast, and below this there is visceral connection. There is only one navel. If food is given to one the other is satisfied, and if medicine is administered to one the other is affected, but not to the same extent as the one to which it was given. The most curious circumstance is that when a sentence is begun by one child the other frequently finishes it. When sleeping, one child lies on her back and the other on her side, which gives an idea of the great flexibility of the connection. The children are very good friends, and seldom quarrel, but when younger their proceedings were not marked by that unanimity which they have since discovered to be essential to their circumstances. As might be expected, when their relations became strained there was considerable tension between them, but when it gradually dawned upon their



THE ORISSA TWINS.

(From a photograph.)

infantile intelligences that when one was hurt the other had to cry out of sheer sympathy, a mutual understanding was arrived at that "rows" should be discontinued, and now balmy peace reigns supreme. For their age, the twins are particularly intelligent. They have been taught English for the last three months, and, although they do not speak more than a few simple words, they seem to understand it fairly well already. The twins have excited a good deal of interest among the medical profession in India.—*Pall Mall Budget*.

Analysis of Coal Tar Preparations.

Messrs. Helbing and Passmore's latest investigation is on the valuation of disinfectants prepared from coal tar. In their report they state that, since the bactericidal properties of these preparations reside in the phenoloid bodies contained therein, the chemical estimation of such bodies is a measure of their activity, so that a bacteriological examination becomes unnecessary. Tar oils contain acids (so called), bases, and hydrocarbons which are more or less present in preparations made from them. A method of chemical analysis applicable to the one is, therefore, suited to the other within certain limits, which are laid down in the report. For determining the hydrocarbons (benzene, anthracene, naphthalene, and the like) the acids in 50 grammes or more of the oils are fixed and removed with 10 per cent caustic soda solution, the oils having first been diluted with an equal volume or more of ether. The ether dissolves the hydrocarbons and bases, and the small quantity of the latter, washed out by the soda, is also removed with ether from the alka-

line liquors. The combined ethereal liquids are next washed with 1 to 4 sulphuric acid to remove bases, after which the ether is treated by washing and evaporation for hydrocarbons.

By fractional distillation the character of these may be studied and the bases may be estimated in the acid liquor by neutralizing with soda, evaporating to dryness, and extracting with spirit, whereby only the salts of the organic bases are dissolved out. The acid constituents of tar oils are phenol and its homologues. Strictly they are not acids, but they associate themselves readily with the soda in the preliminary treatment, and are to be sought for in the alkaline liquors. The process which Helbing and Passmore suggest for this is simple, viz., to acidify with sulphuric acid and extract the "acids" with ether, which, on evaporation, yields a residue of the phenoloid bodies. It is impossible, the authors say, to separate carbolic acid from its homologues by practical distillation, owing to the close proximity of their boiling points, and the only method which they found practicable was to fractionally precipitate the alkaline solution of tar acids with small quantities of mineral acid, whereby the carbolic acid is concentrated in the first fraction. So working they were able to satisfy themselves that Jeyes' fluid contains less than 0.25 per cent of carbolic acid and 48 per cent of other phenoloid bodies.

An Australian Seymnus Established and Described in California.*

BY C. V. RILEY.

The rapidity with which the Australian *Vedalia cardinalis* has established itself in California is familiar to every one. But the vedalia was not the only scale-feeding Coccinellid which was sent or brought over by Mr. Koebele on his first trip to Australia in 1888-89. Among others he brought several species of the genus *Seymnus* which, in due time, were set at liberty in the vicinity of Los Angeles. One of these, subsequently described by Dr. D. Sharp as *Seymnus restitutor* (*Insect Life*, I, p. 364), was lost sight of, while another much smaller species, originally collected by Mr. Koebele near Sydney, New South Wales (see Bull. 21, Division of Entomology, p. 24), turned up the present year in a rather amusing way. In the March number of the *Entomological News* (vol. iii., 1892, p. 51) Dr. F. E. Blaisdell describes a new Californian *Seymnus* under the name of *S. lophanthæ*. He found it preying upon the San Jose scale (*Aspidiotus perniciosus*), which infested the limbs of *Acacia lophanthæ* at the Coronado Parks near San Diego, in Southern California. It is a very inconspicuous species of reddish color, the thorax often having an indefinite dark spot on the disk, and the elytra being of a blackish bronze color. The last mentioned character is foreign to our native species of *Seymnus*, which never show any traces of metallic color, and, for this reason, I at once suspected, upon reading the description, that *S. lophanthæ* was one of the species introduced from Australia. Upon comparing Dr. Blaisdell's description with the sample specimens sent by Mr. Koebele from his first and second trips to Australia, I had no difficulty in identifying *S. lophanthæ* with the species from Sydney mentioned above. Subsequently Mr. D. W. Coquillett sent me a specimen recently captured near Los Angeles which fully confirmed this identification. Whether or not the species has been previously described from Australia, I have no special means of knowing; but it does not appear to be among those described by Mr. Blackburn in 1889 (*Trans.*, etc., Royal Society, South Australia, xi., pp. 191-198). It is closely allied to *S. fagus* Brown, from New Zealand, and distinguished therefrom only by its finer and sparser elytral punctations and the greater extent of the pale thoracic color.

Dr. Blaisdell does not mention in his description the structural characters of the species, the more important of which are as follows: Prosternal lines long, straight, and converging slightly anteriorly; post-mesocoxal line slightly reascending externally; post-metacoxal line complete, almost reaching the first abdominal suture; elytral epipleurae horizontal, reaching beyond third abdominal segment, slightly concave; inner marginal line not leaving the margin.

The beetle and its larvae are quite abundant in the Coronado Parks, according to Dr. Blaisdell; and since it also occurs near Los Angeles, there can be no doubt that this useful little Coccinellid has fully established itself in Southern California.

MacKey's Gang Sawmill.

This mill—the name of the inventor of which was inadvertently printed MacRey in our issue of October 15—is adapted for the cutting of lumber into bevel siding or boards, etc., by the addition of any of the ordinary feed motions, as well as the cutting of shingles. The mill is the invention of Mr. William T. MacKey, of Vancouver, British Columbia, and is being placed on the market by the MacKey Patent Gang Mill Co., of Vancouver, Toronto, and Canada.

* Read at the meeting of the Association of Economic Entomologists, Rochester, August 17.