

**New Agricultural Inventions.**

Mr. G. R. Pierpont, of North Haven, Conn., has invented a new Straw Cutter, or machine for cutting hay, straw, etc., for feed. It has two cutting blades, pivoted together like a pair of scissors, operated by connecting bars and a double crank, and arranged at the end of the feed box, in connection with an adjustable gauge plate and guides.

An improved Machine for Separating Garlic from Grain, recently patented by Messrs. D. Shamberger and J. Carroll, of Beckleysville, Md., consists of a revolving cylinder having teeth or cards, in combination with a pressure roller at one side and a clearing brush at the opposite side, the grain being conducted off below the pressure roller and the garlic below the clearing brush.

Mr. N. D. Edmondson, of Crown Point, Ind., has designed an improved Sulky Scraper for grading roads, lawns, etc., in which the mechanism for holding the scraper in position for collecting or discharging the load, or carrying it from place to place, is efficient and readily controlled by the driver.

A light and strong Picket Fence, patented by Mr. C. H. Phelps, of Williamsfield, Ohio, is made by combining, with the pickets, longitudinal T rails formed of two side bars riveted to the pickets, and slotted top bars secured to the side bars by keys through the pickets. The posts are braced by anchors secured to the fence by brace rods and a yoke.

A new Gate, of the class in which a person on horseback or in a wagon is enabled to open or close the gate by operating a projecting lever, has been patented by Mr. B. B. Huntington, of New Richmond, Wis. Its advantage consists in simplicity of construction and being made without pulleys or wires.

A convenient Apparatus for Steaming Feed, which is claimed to generate steam with small consumption of fuel, and to furnish dry steam for heating, etc., has been patented by Messrs. D. D. Darling, L. L. Parshall, and F. H. Wendell, of Coldwater, Mich. It consists of a furnace with a central tube and coil of pipe, connected by a top and bottom pipe, with a tank having a central downward extending pipe for supplying water, a float, and a steam exit pipe.

Mr. S. Carnes, of Jonesborough, Ga., has made an improvement in Plow Stocks, intended to give increased strength and lightness. It consists in making the standard in two parts, bolted together at their middle and lower ends, one bar passing up and bending over the plow beam and adjustable vertically upon it, while the other bar is bent rearwardly to form a brace.

Mr. H. M. Freeman, of Lathrop, Mo., is the inventor of an improved Riding Attachment for Plows, which is claimed to be so constructed that the plow may be adjusted to work at any desired depth, that the frame is kept level whether the plow is running upon a level with the wheel or below it, and that the plow may be turned upon a square corner.

An improved Bale Tie, invented by Mr. C. H. Chase, of New Orleans, La., is a strip of sheet metal having one of its ends doubled over upon itself, the same being bent on a line drawn across the strip at an angle of 45°, so that the folded end forms a right angle with the main part of the strip. The folded over portion is returned upon itself and again bent forward, forming a U-shaped loop for receiving the opposite end of the tie, which has oblong apertures for receiving the bent end.

Mr. S. Ruggles, of Three Rivers, Mass., has patented a Potato Bug Exterminator, consisting of a poison reservoir carried on the back, and having two sprinkling tubes, so as to save time by operating on two rows of plants at once. Within the reservoir is a reciprocating stirrer, which is operated by an angular lever strapped to the arm.

An improvement upon the Corn Sheller patented August 17, 1875, by Messrs. W. H. Hall and C. S. Yingst, of Tiffin, Ohio, has been made by one of the original patentees, Mr. Hall. It relates to details of construction designed to produce a better article at less cost than heretofore practicable.

Mr. Henry Cutler, of Wilbraham, Mass., is the inventor of a new Grain Drier which is claimed to effect its purpose rapidly without danger of burning the grain. It consists of a cylinder, provided with suitable feed and discharge ducts, and heated by a current of hot air. In this is a revolving hollow shaft carrying steam heated arms, which constantly stir the grain.

Mr. R. W. Hazen, of Fremont, Neb., has patented an improved Ventilator for Corn Cribs, for ventilating the mass of the corn, to prevent it from spoiling, hasten the drying, and bring it quicker into marketable condition. The invention consists in slotting the floor of the crib with air passages, and by a peculiar arrangement of boards and blocks preventing leakage of any shelled corn.

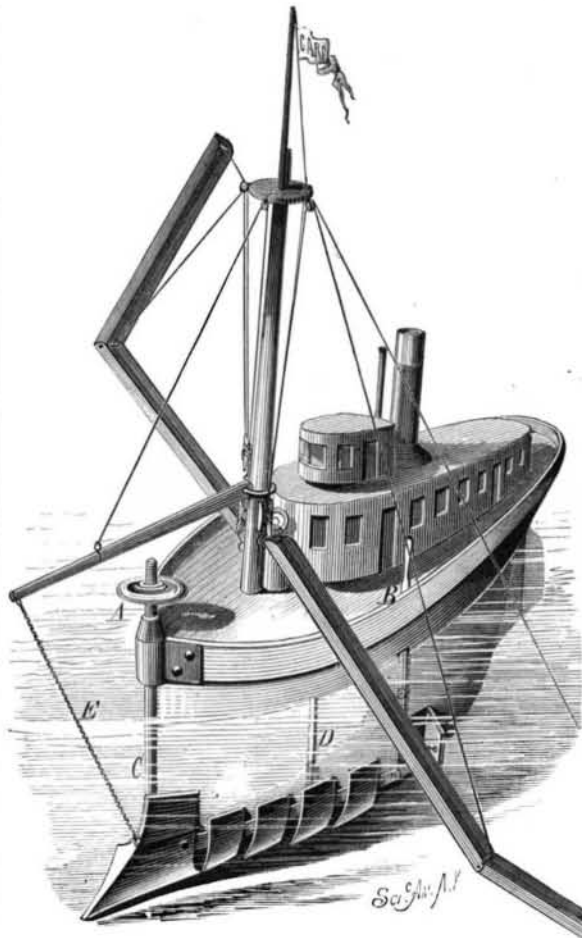
An improved Hay Press, invented by Mr. H. R. Smith, of Minnesota Lake, Minn., may be briefly described as a pressbox with a reciprocating follower, operated by suitable lever mechanism. The top and bottom of the pressbox are longitudinally slotted, the slots being wider at one end than the other, for the purpose of facilitating the passage of the bands in tying them around the bale. The follower is made of sections with enlarged heads, which leave spaces just wide enough for the passage of the bands.

A new Baling Press has been invented by Mr. J. H. Simonson, of East Norwich, N. Y. The peculiarity of construction is the means by which the power and resistance are

both applied to compressing the bale, and the automatic upward movement of the upper follower when the power is removed.

**CARR'S IMPROVED DREDGER.**

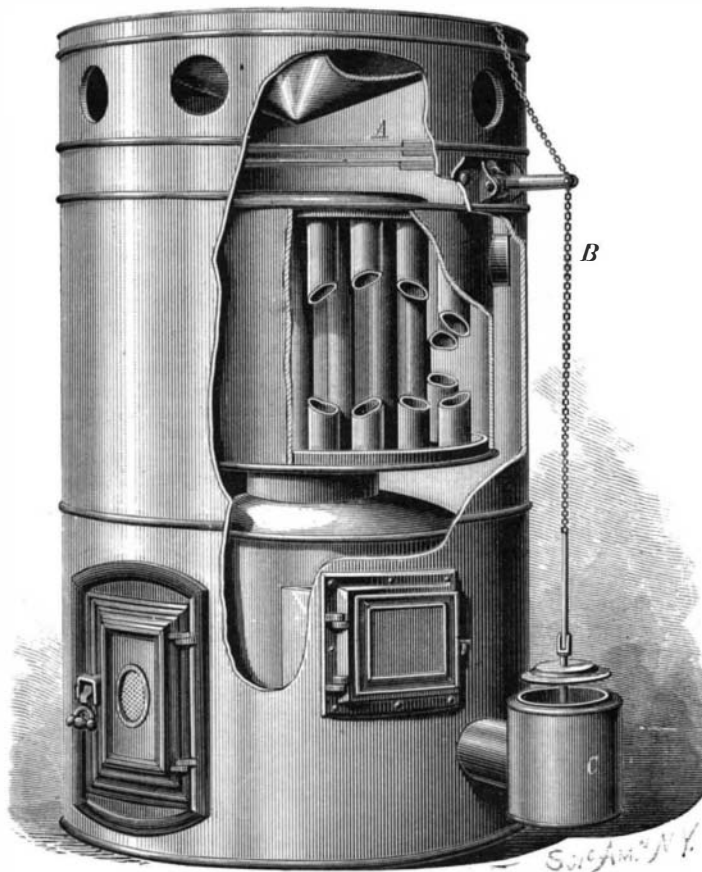
We illustrate herewith a new submarine excavator, designed to be attached directly to the bow and sides of a ves-



CARR'S IMPROVED DREDGER.

sel, and to be used for removing sand bars, submarine marshes, and other obstructions to navigation.

On the bow of the boat is an iron bar, to the lower end of which is secured a double mould-board plow. The upper end of the bar forms a screw rod, passes through a bearing, and is provided with a wheel, A. To each wing of the plow is pivoted a bar, and to these bars are attached several single mould-board plows. To the rear end of each bar is attached



HOLCOMB'S HOT AIR FURNACE.

a jointed lever, B, by means of which each series of plows can be raised or lowered, while all the plows can be lifted by the wheel, A. This adjustment being at the bow of the boat, if the vessel is stopped before it gets through an obstruction, the plows can be raised, and the boat backed and extricated. The plows may then be lowered again and work resumed. As the plows enter the bottom the material is loosened and swept away by the current. The front plow is firmly secured by a shield, C, and side bars, D, are provided to keep the side plows from swinging under the boat.

In case there is not enough current to remove the loosened matter, the inventor proposes to use a centrifugal pump, placed in the center of the boat, whereby the water can be raised and discharged into tank flats; or, by means of troughs on each side of the boat, can be discharged from thirty to forty feet from each side of the same, thus making a channel from sixty to eighty feet wide. When it is desired to lower the plows several feet below the boat, the chain, E, from the bowsprit relieves the increased strain on the upright plow beam.

Patented April 9, 1878. For further particulars address the inventor, Dr. Thomas B. Carr, Wilmington, N. C.

**The Newton Photo-Plates.**

At a recent meeting of the Photographic Section of the American Institute, in this city, examples of pictures taken by means of the emulsion or sensitized collodion of Mr. Henry J. Newton were exhibited. The author claimed that his emulsion plates were as sensitive to weak lights as any bath plates that can possibly be made; that they give all the detail in the shadows or dark places that it is possible to get by any process; that the emulsion keeps indefinitely; finally, that the Newton emulsion will do anything that can be done with the bath plate in one third of the time.

Mr. Bierstadt accepted the challenge of Mr. Newton as to bath plates, but at the same time stated that the Newton negatives there exhibited, done in eight seconds, and the prints therefrom, he had never seen excelled, if equaled, by any photographic process.

Mr. Mason, another distinguished photographer, pronounced the specimens perfect, the details in the shadows and high lights as finely rendered as any that he had ever seen.

A description of the Newton process was given several months ago in the SCIENTIFIC AMERICAN.

**Adulteration of Soap.**

The following receipt is extracted by *Dingler's Pol. Journal* from the *New Soap Boiler's Journal* (*Neue Seifensiederzeitung*): "Saponify 600 kilos. cotton seed oil, 200 kilos. tallow, and 200 kilos. bone oil, with potash lye at 18° in the usual manner. A thick mixture is then made of solution of potash, potato flour, and soluble silicate of soda, and two parts of soap are crutched thoroughly up with one part of this mixture, boiled, and mixed with more soda lye till the total weight rises to more than double that of the fatty matter originally present." *Dingler's Journal* remarks that when trade organs thus openly recommend sophistication caution is needful on the part of purchasers.

**IMPROVED HOT AIR FURNACE.**

We illustrate in the accompanying engraving an improved hot air furnace, the principal novelty in which is the automatic means for regulating the admission of cold air into the fire chamber. This device consists in a series of brass strips at A, connected together and aggregating a length of some fifteen feet. These are so arranged that the total movement due to their expansion is communicated to the chain, B, which passes around an arm and operates a double valve at C, in the air passage leading to the fire box. The contraction of the strips raises the valves and admits air to the furnace; their expansion due to an increase of temperature allows the valves to drop on the seats and so exclude air. It will be observed that the air is admitted at the side of the fuel, and that there is no damper in the smoke pipe. Smoke is thus caused to be consumed, and the fire is much more easily regulated.

The fire box is made of No. 16 wrought sheet iron, and is lined with specially prepared fire brick. The radiator contains 24 tubes, each 3½ inches in diameter, made of soft charcoal wrought sheet iron. The general shape of the furnace is such that the heat is diffused evenly over the inside. The conical cap on top deflects the heated air into the hot air pipes. It can easily be removed to afford access to the interior.

Patented April 16, 1878. For further particulars address the inventor, Mr. Henry Holcomb, Painesville, Lake Co., Ohio.

**Live Hogs for England.**

A number of butchers and provision dealers in Liverpool, England, have clubbed together for an experimental importation of live hogs from this country. They have purchased a steamer and had her fitted for the accommodation of 2,500 hogs between decks, besides a large number of cattle on the main deck. If the venture turns out well they propose to establish a full line of steamers for this business. Facilities have been provided for killing and dressing the hogs on board in case of necessity.

**Six Years' Progress in Making Steel Rails.**

The manufacture of steel rails was begun in this country in 1872. During that year 94,000 tons were made; in 1873, 129,000 tons; in 1874, 145,000 tons; in 1875, 300,000 tons; in 1876, 400,000 tons; in 1877, 420,000 tons. During the present year the product is expected to reach as many as 500,000 tons. In 1872 the average price of a ton of Bessemer steel rails was \$115. Now the average value is about \$42. Owing

to recent improvements in machinery it is expected that the cost of production will be reduced to such an extent as to enable America to compete successfully with England in neutral markets. Inquiries begin to come in from South America, and there is a fair prospect that in a few years the exportation of steel rails will become possible.

**BIRDS OF PARADISE.**

The Zoölogical Society, of London, have just made an important addition to their attractive collection in the shape of two male examples of the lesser Bird of Paradise in full plumage, for an illustration of which we are indebted to the *Illustrated London News*.

The lesser Bird of Paradise (so called from its being somewhat smaller in size, though not inferior in beauty to the greater Bird of Paradise, *Paradisæa apoda* of naturalists) is very abundant in certain parts of the northern peninsula of New Guinea, and is also found in the adjacent islands of Mysol and Salawatty. It lives in bands in the vast forests, feeding principally on mucilaginous fruits of various fig trees, but occasionally devouring grasshoppers, locusts, and other insects. The splendid plumes, so well known under the name of Paradise Birds' feathers, are only developed by the adult male birds, the females and young males being comparatively insignificant in appearance. These specimens are very rare, only two examples of the same species having been previously conveyed to England.

**Silk Culture in America.**

In January, 1876, Mr. Samuel Lowery, principal of an industrial school for colored people, at Huntsville, Ala., started the culture of silkworms in that State by procuring 500 eggs. Only 200 proved fruitful; but from the cocoons spun by them about fifteen spools of silk thread were made by a rude hand process. The thread was exhibited at the Huntsville Fair, and attracted considerable attention. In 1876, Mr. Lowery hatched 500 worms, from which he got silk enough for twenty spools of thread. Last year the crop numbered 100,000 worms. Fed on white mulberry trees, the worms did well, and thus far no symptoms of disease have been noticed. It is now proposed to plant twenty acres with mulberry cuttings, which, in the course of a year, will furnish food for two or three million worms.

The new industry is thought to be very promising for the colored population of the South. Suitable land can be had for from \$4 to \$20 an acre, and farms of twenty acres or less will furnish employment and support for a family. In France the silk culture is almost wholly carried on by small farmers, and in Alabama the cultivators have the advantage of being able to gather two harvests in a year. Raw silk is worth from \$4 to \$6 a pound, and the value of raw silk imported amounts to something like \$6,000,000 a year.

**FIBRIN.**—M. Setchenoff has found that the white of eggs, on being boiled in vacuum, turns solid as fibrin. In order to ascertain if the yellow of eggs has some influence on this reaction, experiments were made, and it was found that when a small quantity of the yellow is admixed, the solidification of the albumen, as mentioned above, is five times quicker. This fact, besides being a matter of great importance for physiology, allows us to obtain the albumen in a more pure form.

**Test of Woody Fiber.**

Dr. Wiesner recommends phloroglucin as an extraordinarily delicate reagent for woody fiber. Place a drop of a half per cent solution of phloroglucin upon a bit of pine, and moisten the spot with a drop of hydrochloric acid, and there immediately appears a beautiful lively red stain, verging upon violet. On drying, the violet tinge becomes still more marked. Even if the solution contains only one hundredth of one per cent of phloroglucin, the red color is very decided; and if there is not more than one thousandth of one per cent, the reaction can be recognized, under proper precautions. If a strip of pine is allowed to remain in such a solution for twenty-four hours, hydrochloric acid gradually draws out a perceptibly reddish satin. The slightest traces of woody substance in vegetable tissues can be readily detected in this manner. The tenderest germs, by means of this reaction, show a woodiness in the cells.

**American Leather in Europe.**

We have the testimony of the leading manufacturer of boots and shoes in Europe to the effect that the leather market is no longer in European hands. America regulates the price, and from being a large importer, we have turned the current, and are exporting enough to affect European production seriously. In his pamphlet, "Look out for Yourselves," addressed to Swiss manufacturers, Mr. Bally says: "European seaports have become, in part, great depots of American leather. All the Europeans interested in the manufacture of leather speak badly of this red American leather; but it is not so much because of its quality and the short time employed in tanning it (because in these respects it can bear comparison with European leather) as because of the very successful competition of this article. Certainly it is not very pleasant to be compelled to recognize the fact that a former market has become a dangerous competitor." Efforts were made as early as 1847 to find a market in England for American leather, and again twenty years later; but it was not until 1872 that an actual demand began to be felt. In the latter half of that year the export of sole leather, from the port of New York, was 311,914 sides; the next year about 660,000 sides were exported; in 1874, nearly 860,000; in 1875, over 917,000; in 1876, there were exported 1,084,522 sides; and from January to November, 1877, the number reached 863,434 sides. A little more than half the leather exported passes through New York. Last year the tanned leather shipped from Boston exceeded \$2,000,000 in value. The exports from Philadelphia, for the same period, amounted to nearly \$1,000,000.

Nearly half the leather exported goes to Germany. The English now rate American leather as unexcelled by any except their best oak-tanned. The German dealers will take nothing but the very best leather.

There is little difference in the machinery employed in the tanneries of this country and England; but owing to the high price of bark the English have resorted to chemical substitutes, and the quality of their leather has been injured. The same cause tends to decrease the annual product of Germany. France keeps out American leather by a high tariff. Denmark, Norway, and Sweden are importing it in small quantities, and there is a small but growing trade with Russia. In

addition to a considerable quantity of rough and finished upper leather, the export this year from all American ports is estimated to be likely to reach 2,000,000 sides. American leather of all kinds, with the exception of finished calf finds a ready market abroad.

**The Bahama Pineapple Tree.**

A large proportion of the area of the Bahama Islands is devoted to the cultivation of fruit, of which oranges and pineapples are the principal; and at the present time the fields in the estates on which the pineapples are growing form a peculiar feature in the landscape. The appearance of the broad expanse of young fruit, with its clusters of delicately tinted, but sharp and serrated leaves, rising only a short distance from the ground, and covering the undulating fields, produces a very remarkable effect. In no other branch of agriculture can so curious a picture be produced as in the growth of these vast numbers of pines. As many as a million and a half of the fruit have been collected from a single



**BIRDS OF PARADISE.**

Every trace of woody substance in hemp and flax can be detected by the phloroglucin. Dr. Wiesner suggests that it may be used to distinguish hemp from flax, and also as a means of dyeing fabrics woven from vegetable fibers.—*Dingler's Polytech. Jour.*

**The Sugar we Use.**

The United States consumes annually between six and seven hundred thousand long tons of cane sugar, less than 13 per cent of which is of home production. The leading sources of foreign supply are; Cuba, 450,000 tons; Spanish possessions, 50,000; Porto Rico, 30,000; French islands, 22,000; Brazil, 18,000; Dutch East Indies, 11,000; British West Indies, 10,000; British Guiana, 10,000; Sandwich Islands, 10,000. Twenty-one other countries supply less than as many thousand tons in all. In 1862 our home product was 191,000 tons; it fell to 5,000 tons in 1865; then slowly rose to 79,600 tons in 1871. The crop of 1876 was 77,000 tons.